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Electric Resistance Heating (ERH) Treatability Study Report for Site 22 Former Building 105 Old Dry Cleaning Facility

Naval Station Great Lakes
Great Lakes, Illinois

Contract Task Order 0009

January 2008

NAVFAC
Naval Facilities Engineering Command
Midwest
201 Decatur Avenue, Building 1A
Great Lakes, Illinois 60088

TETRA TECH NUS, Inc.

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ELECTRIC RESISTANCE HEATING (ERH) TREATABILITY STUDY REPORT FOR SITE 22 FORMER BUILDING 105 OLD DRY CLEANING FACILITY

NAVAL STATION GREAT LAKES
GREAT LAKES, ILLINOIS

COMPREHENSIVE LONG-TERM ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

Submitted to:
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ACRONYMS

bgs	Below ground surface
COC	Chemical of concern
cVOC	Chlorinated VOC
EPC	Exposure point concentration
ERH	Electrical Resistance Heating
Ft/day	Feet per day
HI	Hazard index
HHRA	Human Health Risk Assessment
ILCR	Incremental lifetime cancer risk
IAC	Illinois Administrative Code
Illinois EPA	Illinois Environmental Protection Agency
ISGS	Illinois State Geological Survey
LUC	Land use control
MCL	Maximum contaminant limit
mg/kg	Milligram per kilogram
NAVFAC MW	Naval Facilities Engineering Command Midwest
NS	Naval Station
PCE	Tetrachloroethene
PID	Photoionization detector
ppm	Parts per million
RCRA	Resource Conservation and Recovery Act
RI/RA	Remedial Investigation/Risk Assessment
TACO	Tiered Approach to Corrective Action Objectives
TMP	Temperature monitoring point
TRS	Thermal Remediation Services, Inc.
TtNUS	Tetra Tech NUS, Inc.
UCL	Upper confidence limit
U.S. EPA	United States Environmental Protection Agency
VOC	Volatile organic compound
VR	Vapor recovery
µg/L	Micrograms per liter

1.0 INTRODUCTION

This Electric Resistance Heating (ERH) Treatability Study Report has been prepared for Site 22, Former Building 105 Old Dry Cleaning Facility, at Naval Station (NS) Great Lakes located in Lake County, Illinois. The report has been prepared by Tetra Tech NUS, Inc. (TtNUS) for the Department of the Navy, Naval Facilities Engineering Command Midwest (NAVFAC MW) under the Comprehensive Long-Term Environmental Action Navy IV Contract No. N62467-04-D-0055, Contract Task Order 0009.

The purpose of the study was to demonstrate the effectiveness of ERH in remediating source area contaminants present at the former dry cleaning facility. The primary goal of the study was to reduce the average concentration of chlorinated volatile organic compounds (cVOCs) in soil to less than 20 milligrams per kilogram (mg/kg). It was calculated that doing so would reduce cVOC concentrations by 95.5 percent. This report summarizes the methodology and results of this study.

1.1 DOCUMENT ORGANIZATION

Section 1.0 of this report presents an introduction to the project, a site description, and a summary of the technology that was demonstrated. Section 2.0 summarizes the design and procedures conducted in the field to implement this technology demonstration. Section 3.0 summarizes the data and evaluates the performance of the ERH system. Section 4.0 includes an update to the Human Health Risk Assessment (HHRA) for the site utilizing the post-remediation data. Section 5.0 summarizes the conclusions of this study and provides recommendations for additional site activities. Appendix A includes the final subcontractor ERH Report prepared by Thermal Remediation Services, Inc (TRS). Appendix B includes well abandonment forms and monitoring well construction diagrams for the re-installed wells. Appendix C contains the investigation- and remediation-derived waste disposal documentation. Appendix D contains field log sheets completed during the study. Appendix E presents survey data for the re-installed monitoring wells. Appendix F presents the laboratory analytical data, chain-of-custody forms, and data validation information associated with the study. Appendix G includes the Resource Conservation and Recovery Act (RCRA) forms for closure of the drum storage area associated with Building 105 and the dry cleaning facility.

1.2 SITE DESCRIPTION

NS Great Lakes is located in Lake County, Illinois, north of the City of Chicago, and encompasses 1.5 miles of Lake Michigan shoreline (see Figure 1-1). NS Great Lakes is used to support naval training and consists of the Administrative Command, the Recruit Training Command, and the Service School

Command. In 1986, an Initial Assessment Study conducted at NS Great Lakes identified 14 potentially contaminated sites. Each site was evaluated with respect to contamination characteristics, migration pathways, and pollutant receptors. The study concluded that seven of these sites warranted further investigation to assess potential long-term impacts. Although Site 22 was not included as one of these seven sites, investigations to close the hazardous waste storage area at Site 22 through the RCRA program identified soil contamination that warranted further investigation.

Site 22, Former Building 105, Old Dry Cleaning Facility, at NS Great Lakes is bounded on the south by Porter Street, on the west by a vacant asphalt-paved lot, on the north by Bronson Avenue, and on the east by Sampson Street, as shown on Figure 1-2. The building was a slab-on-grade structure measuring approximately 150 feet by 70 feet. The former 10,500-square-foot building occupied a lot measuring approximately 250 feet by 115 feet. NS Great Lakes (United States Environmental Protection Agency [U.S. EPA] # IL7170024577) has operated with RCRA interim status authorization since November 19, 1980. Building 105 was originally included in a RCRA Part A permit that has been modified over the past 25 years. This RCRA drum storage unit is located in the southeastern quarter of the northwestern quarter of the southwestern quarter of Section 4, Township 44 North, Range 12 East (TtNUS, 2003).

1.2.1 Site History

Building 105 was constructed in 1939 and was utilized as a dry cleaning facility until 1993 or 1994 when it was converted to a vending machine supply and repair station. From 1993 or 1994 until February 2001, the building was used to warehouse and repair vending equipment and products. The vending machine supply and repair operations ceased in February 2001, and the building was vacant until it was demolished in March 2003.

The RCRA unit in Building 105 (SO1) consisted of a drum storage area located inside the building along the eastern wall. Hazardous waste consisting of spent tetrachloroethene (PCE) from the laundry facilities was stored in this area from 1980 until 1987. The maximum quantity of waste stored at this unit is unknown; however, according to the revised RCRA permit, 165 gallons (three 55-gallon drums) was the maximum amount of waste stored at one time. The storage area consisted of the concrete floor (no berms or curbs were present) within the building adjoining the concrete block exterior wall. Near the storage area, two cracks and construction joints were observed in the concrete floor, as well as a garage-type entry door and several floor drains. Historical building foundation plans show that the floor drains were connected to the storm sewer system located outside of the building. No visual evidence of spillage (staining) was observed or reported in this area, and the floor was in good condition in February 2003 as indicated in the Remedial Investigation and Risk Assessment (RI/RA) Report (TtNUS, 2004).

The building foundation plans also show two 6-inch-diameter drains running from the gutter under the washing machines associated with the previous laundry operations. These drains were connected to a grease catch basin located outside the southeastern corner of the building. The grease catch basin was approximately 5 feet by 7.5 feet by 5.5 feet deep and had a 6-inch-diameter tile effluent pipe. It is speculated that the effluent line from the grease catch basin was connected to a manhole located outside of the building along Sampson Street for the sanitary lines for NS Great Lakes and that the soil and groundwater contamination at the site is derived from this aspect of the dry cleaner operations (TtNUS, 2006a).

1.2.2 Geology and Hydrogeology

Fill material consisting of gravel, sand, silt, cinders, and occasionally bricks is present over most of Site 22 to thicknesses of up to approximately 5 feet. Below the fill material layer is a heterogeneous mixture of sandy clays, gravelly clays, and silty clays with discontinuous silt and sand stringers to a depth of 30 feet below ground surface (bgs) that is considered the undisturbed, shallow subsurface lithology of Site 22. Immediately below this is a fine- to coarse-grained sand layer that appears to be laterally extensive over much of the site. The thickness of this sand layer varies slightly, ranging from approximately 7 to 10 feet thick. Immediately below this sand layer are clays and silty clays. Laboratory sieve analysis of composite samples from the undisturbed, shallow subsurface lithology indicates that the Unified Soil Classification System descriptions of these soils are ML (sandy silt) to CL (silty clay).

Two separate aquifers are present at Site 22, a shallow (water table) and a deep confined aquifer. The shallow aquifer ranges from 4 to 30 feet bgs and is composed primarily of unconsolidated clays, silts, and silty clays with discontinuous sand and gravel lenses interspersed throughout. In general, the water table within these heterogeneous soils is shallow and is typically encountered at a depth of 4 to 18 feet bgs at the site. Groundwater can be expected to migrate horizontally in the more permeable materials found in the silts and clays.

The groundwater flow pattern for the shallow aquifer is fairly complicated. The horizontal groundwater gradient is very similar across most of the site, although the direction varies widely. Groundwater flow in the shallow aquifer is to the west, east, and south. From a very general perspective (considering the four monitoring wells located around the perimeter of the site – MW01S, MW02S, MW07S, and MW08S), groundwater migrates southwest in the general direction of Pettibone Creek. However, based on the undisturbed, shallow subsurface lithology, horizontal groundwater flow occurs only in the discontinuous sand and gravel lenses. Therefore, large-scale site-wide (and off-site) transport of the contaminants is not likely.

Horizontal hydraulic conductivity in the shallow aquifer ranged from 0.00248 feet per day (ft/day) to 3.53 feet per day, with a geometric mean of 0.186 ft/day. Using the geometric mean hydraulic conductivity, the hydraulic gradient for the site (ranging from 0.03 to 0.04, and a porosity of 0.35, a groundwater velocity ranging from 6.21 to 8.25 feet per year was calculated (TtNUS, 2006a).

The deep aquifer ranges from 30 to 40 feet bgs and is composed of fine to coarse sand. Static groundwater levels in wells screened in the deep aquifer ranged from 5 to 8 feet bgs.

Based on the low permeability, lack of large-scale site-wide transport, and the fact that the majority of the water remains on site, the water present in the subsurface is considered "pore water" and is referred to as such throughout this report.

1.2.3 Summary of Source Area Contamination Assessment

Soil and groundwater sampling was conducted at Site 22 by several contractors over the last 10 years. According to these investigations, the chemicals of concern (COCs) are PCE and cis-1,2-dichloroethene in soil and groundwater. The source area/"hot spot" of contamination is located near the southeastern corner of the Building 105 along Sampson Street near the former grease catch basin and consists mainly of PCE-contaminated soil with PCE-contaminated pore water in the area of the highly contaminated soil.

PCE and its degradation products, trichloroethene, cis-1,2-dichloroethene, and vinyl chloride, were detected in surface and subsurface soil at concentrations exceeding screening levels for groundwater protection. The cVOC concentrations reported for soil in the southeastern corner of the site also exceed the Illinois Environmental Protection Agency (Illinois EPA) Tiered Approach to Corrective Action Objectives (TACO) criteria for human exposure by incidental ingestion and inhalation (Illinois EPA, 2004). The Illinois EPA has classified the contaminated media (soil and pore water) at Site 22 as a listed hazardous waste for PCE (F002). If the contaminated media are removed from the site, they would have to be identified as a listed hazardous waste. Impacted soil and groundwater around the former drains and grease catch basin are limited to shallow depths (up to 20 feet deep), with the highest concentrations being between 8 to 20 feet bgs. Impacts to the deeper aquifer are limited both in concentration and migration potential due to the geology of the site. Historical surface and near surface soil samples north of the hot spot, in areas subsequently regraded during site demolition and construction activities, also contained contamination exceeding TACO criteria.

Prior to remedial activities, additional soil samples were collected to better delineate the site contamination and allow for design of an effective ERH treatment system. More information on this sampling is included in Section 2.1.1.

1.3 ERH TECHNOLOGY DESCRIPTION

Based on the factors presented in the Feasibility Study (TtNUS, 2006a), the Navy, with concurrence from Illinois EPA, decided to implement a treatability study utilizing ERH to address the cVOC contamination in the subsurface. This section provides a general description of the technology. Details on design and implementation at this site are presented in Section 2.0.

Developed in early 1990s by the Pacific Northwest National Laboratory, ERH uses an electrical current to heat less permeable soils such as clays and other fine-grained sediments so that water and contaminants trapped in these relatively conductive regions are vaporized and available for vacuum extraction. This technology has been demonstrated as an effective technology for the removal of volatile and some semivolatile contaminants from soil and groundwater. Such contaminants generally include dense, non-aqueous-phase liquids consisting of cVOCs such as trichloroethene and PCE, and also the light, non-aqueous-phase liquids such as the petroleum hydrocarbon products.

During ERH application, electric current is passed into the subsurface through vertical, angled, or horizontal electrodes. Electrodes are generally installed in the less permeable subsurface soil matrix through conventional drilling techniques that are used to install monitoring wells. Electric current, passed through the electrodes into the subsurface is conducted through the moisture present in the subsurface soil where the resistance it encounters leads to a uniform heating of the subsurface. This heating of the soil boils the groundwater rendering the subsurface dry and fractured and thus more permeable. Contaminants present in these fractures and the groundwater are consequently vaporized and then vacuum extracted by the above-ground vapor recovery system. Although silt and clay soils exhibit low permeability, they are more electrically conductive than sand due to increased porosity and moisture content. In addition, the surface of clay particles is naturally charged. Electrically conductive regions of the soil heat up more vigorously and quickly as they attract a greater electric current. Thus, ERH is an effective method of heating less permeable soils where dense non-aqueous-phase liquid tends to accumulate.

The increase in the temperature of the subsurface is measured by thermocouples installed throughout the treatment area. Typically, thermocouples are placed at various depths and readings obtained throughout ERH operation are utilized to optimize electrical input to the subsurface.

Vapor recovery (VR) wells and a vacuum blower are used to create a negative pressure in the subsurface and extract volatized vapor and steam created during the heating of the vadose and saturated zone. The extracted vapor/steam mixture passes through a condenser; the condensed steam is then cooled before being reinjected into the subsurface to help maintain moisture content in the electrode borings to enhance electrical conductivity between the electrodes and the soil matrix. The recovered vapor then passes through a heat exchanger and cooling tower before passing through a granular activated carbon (or other treatment) unit, if necessary, and discharged to the atmosphere (Battelle, 2006).

1.4 TREATABILITY STUDY EXPECTATIONS AND GOALS

An ERH treatability study was implemented at Site 22. The primary focus of this study was to significantly reduce the mass of cVOCs in the source area and to determine the design parameters for a full-scale implementation. The results of the study were also evaluated to determine the effectiveness of the ERH in reducing the concentrations at the site sufficiently to allow implementation of a closure plan that incorporates land use controls (LUCs) for the soil and pore water at the site.

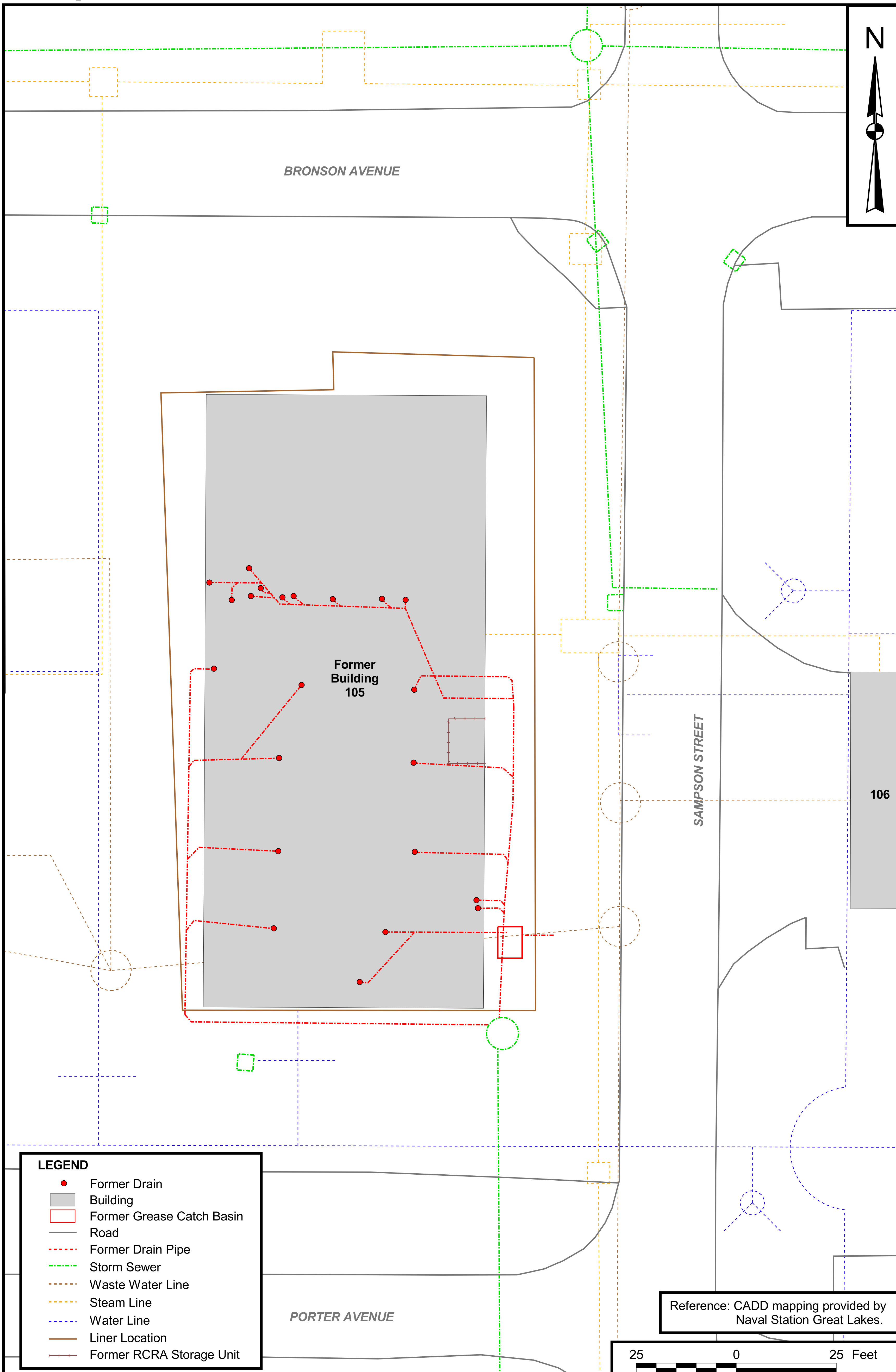
Goals for the study included achieving and maintaining adequate temperatures throughout the treatment zone, recovery of a significant portion of the cVOC mass in the subsurface, and reductions in cVOC soil and pore water concentrations at the site. More details on the goals of the study are presented in Section 2.4. The performance of the system in reaching these goals is presented in Section 3.0.

P:\GIS\GREATLAKES_NTC\APRS\BLDG105.APR SITE LOCATION MAP 6/5/07 KM

DRAWN BY K. PEILA	DATE 12/2/03	SITE LOCATION MAP SITE 22 - BUILDING 105 OLD DRY CLEANING FACILITY NAVAL STATION GREAT LAKES, ILLINOIS	CONTRACT NUMBER N00078
CHECKED BY C. PIKE	DATE 6/5/07		APPROVED BY RFD — DATE 5/25/05
COST/SCHEDULE-AREA			APPROVED BY — DATE —
SCALE AS NOTED			DRAWING NO. FIGURE 1-1 — REV 0

NAVFAC

P:\GIS\GREATLAKES_NTC\APRS\BLDG105.APR SITE MAP 6/5/07 KM



DRAWN BY K. PEILA	DATE 8/17/05	
CHECKED BY C. PIKE	DATE 6/5/07	
COST/SCHEDULE-AREA		
SCALE AS NOTED		

NAVFAC

SITE MAP

SITE 22 - BUILDING 105 OLD DRY CLEANING FACILITY

NAVAL STATION GREAT LAKES

GREAT LAKES, ILLINOIS

CONTRACT NUMBER 00078		
APPROVED BY RFD	DATE 8/17/05	
APPROVED BY —	DATE —	
DRAWING NO. FIGURE 1-2		REV 0

2.0 TECHNOLOGY IMPLEMENTATION

2.1 ERH TREATABILITY STUDY DESIGN

Prior to implementing the ERH treatability study, pre-remediation sampling was conducted to delineate the treatment area and determine baseline soil and pore water concentrations. Utilizing the results of this pre-remediation sampling and previous sampling events, the ERH treatability study system design was completed.

2.1.1 Pre-Remediation Sampling

In November 2005, prior to design of the ERH treatability study system, TtNUS conducted soil and pore water sampling to determine the optimal extent of the ERH treatability study and to provide baseline data for evaluation of the effectiveness of the study in reducing cVOC concentrations at the site. The sampling included the following:

- Collection of six surface and near surface soil samples in areas shown to contain contamination prior to site demolition and regrading activities in the area north of the hot spot. These samples were utilized to determine if contamination was still present in these areas and whether it would have to be addressed.

- Collection of eight soil samples in the vicinity of the hot spot in the southeastern portion of the site (the projected ERH treatability study area). These samples were intended to delineate the area to be remediated vertically and horizontally and to provide baseline data from within the hot spot area to allow for comparison with post-remediation samples.

- Collection of pore water samples from four wells inside the hot spot area. Data from three of the wells were also compared to data from treatability performance samples to determine reductions in cVOC concentrations in the pore water. Results for the pore water samples from monitoring well MW05S have historically been less than TACO criteria and were not used to determine reductions in cVOC concentrations.

The samples were laboratory analyzed for VOCs. The rationale for collection of each of the soil samples and analytical results from the soil sampling are summarized in Table 2-1 and presented in Figure 2-1; pore water results are summarized in Table 2-2.

The results of the sampling indicated that the surface and near surface contamination previously observed north of the hot spot area was no longer present; therefore, no remedial action was proposed for this area.

Based on a review of the data, it was determined that the areas with soil concentrations greater than 20 mg/kg of PCE would be addressed via the ERH treatability study system. This incorporated a surface area of 2,400 square feet and three depth intervals; surface to 8 feet in the western portion of the area, surface to 18 feet in the center portion, and surface to 25 feet in the northeastern portion. Utilizing these depths, a total of 1,400 cubic yards of soil would be addressed by the system.

Additionally, as part of the data analysis, 15 soil samples from recent and historical sampling activities were selected to provide the pre-remediation baseline sample set. These samples are from a total of nine locations; at six locations, multiple sample depths were included in the set. This sample set provided a basis for comparison with samples collected during the treatability study to determine overall contaminant reduction. These samples represented locations throughout the entire remedial area at various depths. Total cVOC concentrations of the samples ranged from 16.9 to 1,500 mg/kg; the average total cVOC concentration was approximately 445 mg/kg. The cVOC concentrations of these samples are summarized in Table 2-3; sample locations and concentrations are presented on Figure 2-2.

A detailed evaluation of these results was presented in the Work Plan for ERH Treatability Study (TtNUS, 2006b).

2.1.2 ERH Treatability Study System Design

TRS was subcontracted by TtNUS to design, install, and operate the equipment for the ERH treatability study. The contract was performance based, requiring a reduction of the average soil cVOC concentration to 20 mg/kg or less (a reduction of 95.5 percent). Based on the final design by TRS, 16 electrodes (installed to various depths), with co-located VR points were required to address the hot spot area as shown on Figure 2-3. Each electrode consisted of a 3-inch-diameter steel pipe installed to the appropriate depth in a 12-inch-diameter borehole. The annular space of the borehole was backfilled with steel shot and graphite to aid in conducting electricity to the surrounding soil matrix. The steel pipe was slotted from 2 to 5 feet bgs to allow vapor recovery.

The amount of energy needed to be input to the area during the ERH treatability study was originally estimated to be 325,000 kilowatt-hours (see Section 2.3.3). It was also estimated that 12 weeks of ERH operations would be required to input the energy necessary for a successful cleanup.

Above-grade equipment included a 500-kilowatt Power Control Unit, a 15-horsepower vacuum blower, a condenser, a cooling tower, and two granular activated carbon vessels.

To monitor subsurface temperatures, three temperature monitoring points (TMPs) were installed within the treatment area. Within each TMP, individual thermocouples were spaced every 5 feet through the zone of heating to automatically record subsurface temperatures in the treatment volume and allow for the creation of subsurface heating profiles.

Due to buried utilities along Sampson Street, the original design was altered and two electrodes in the “H” row were moved 2 feet into Sampson Street (see Figure 2-3). These electrodes were completed 18 inches below grade to isolate them from the vehicle and pedestrian traffic on Sampson Street. The other electrodes were completed above grade in accordance with the original system design.

Four electrodes and one TMP were installed to a depth of 9 feet bgs on the western side of the site, designated as Area 3. Temperature monitoring depths in Area 3 were established at 1, 5 and 8 feet bgs. The central portion of the site was designated as Area 2, and nine electrodes and one TMP were installed to 18 feet bgs. Temperature monitoring depths were set at 1, 5, 10, 15, and 18 feet bgs. Treatment in the northeastern area of the site, Area 1, extended the deepest, with three electrodes and one TMP installed to 26 feet bgs. Thermocouples in the Area 1 TMP were placed at 1, 5, 10, 15, 20, and 25 feet bgs. A design change was made to the electrodes in the “G” row resulting in the conductive interval of each electrode being lowered from 1 foot bgs to 6 feet bgs due to the presence of an abandoned steam chase.

Additional information on the system design (including design drawings of the electrode/TMP locations and construction and a process flow diagram showing the above-grade equipment) is included in the Final Report issued by TRS in December 2006 (Appendix A) and the Work Plan for ERH Treatability Study (TtNUS, 2006b). Photographs of the ERH treatability study system are included at the end of this section.

2.2 FIELD IMPLEMENTATION CHRONOLOGY

The chronology of field events is summarized in Table 2-4. Construction of the ERH treatability study system began on April 17, 2006, and the system was completed and ready for operational testing May 8, 2006. The installation was approved for operation and energized on May 22, 2006, and system start-up began. Power was applied to the subsurface until October 4, 2006, and the VR blower and condenser remained operational until October 16, 2006.

As described in Section 2.4, numerous soil sampling rounds were performed to evaluate the performance of the treatability study. Soil sampling was conducted during system operation to measure the amount of remaining contamination in the treatment area and to guide operational changes intended to optimize remediation efforts towards the most impacted portions of the site. This included a baseline sampling event (described above) and four performance sampling rounds that took place on July 11, August 8, September 12, and September 28, 2006.

2.3 FIELD IMPLEMENTATION AND PROCEDURES

2.3.1 Electrode and Surface Equipment Installation

Sixteen electrodes with co-located VR wells were installed across the treatment area from April 24 through May 1, 2006. TTL, Inc. used a hollow-stem auger rig to advance the boreholes for each co-located electrode/VR well to their design depths. Due to buried utilities oriented along Sampson Street, the 2 electrodes in the “H” row were moved two feet into Sampson Street. As-built locations of the electrodes and TMPs are presented on Figure 2-3.

Surface construction, including VR piping and electrical supply cabling to the electrodes/VR wells, was completed during the week following drilling. TRS installed vapor-phase granulated activated carbon vessels for the potential treatment of extracted cVOCs on May 8, 2006. The system was fully constructed and ready for operational testing on May 8, 2006.

From May 8 to May 22, 2006, an electrical contractor installed a 500-kilowatt step-down transformer, service disconnect switch and meter inside the fenced treatment area. They also used horizontal boring methods to connect a nearby 13,200-volt service to the step-down transformer. TRS completed the installation of the power from the service disconnect switch and meter to the Power Control Unit before final inspection by NS Great Lakes facility electricians.

2.3.2 Monitoring Well Abandonment

Because of the high subsurface temperatures achieved by ERH, the integrity of monitoring wells in the vicinity of the treatment area would be compromised. Therefore, four monitoring wells were abandoned prior to remediation (MW05S, MW010D, MW010S, and MW06S) on April 25 and 27, 2006. Water Well Sealing Forms are included in Appendix B.

Monitoring wells MW010D, MW010S, and MW06S were reinstalled in approximately the same locations (see Figure 2-3) and with the same depth and construction characteristics on March 6 and 7, 2007. The monitoring well construction logs for these wells are provided in Appendix B. Due to historically low pore water concentrations exhibited at MW05S [less than 1 microgram per liter (μg/L)], this well was not reinstalled.

2.3.3 System Start-Up and Operation

Start-up and shakedown of the ERH treatability study system began on May 22 and 23, 2006. After the electrical and VR connections were complete, power was applied to the VR blower and steam condenser so that they could be tested. After proper operation of the internal and external interlocks for each system component was verified, power was applied to the electrodes so that start-up step-and-touch voltage safety testing could be performed. Interlocks were connected between each unit of equipment to make sure that the electrodes were de-energized if there was a loss of vapor recovery or an internal malfunction. No voltage potentials greater than the 15-volt limit established by TRS were found at the site.

With the initial voltage safety survey complete, the applied voltage to the subsurface was slowly increased throughout the remainder of the day. With each voltage increase, checks for surface voltage were performed and results recorded. In no instance did readings exceed the TRS 15-volt limit.

The ERH treatability study system was left off line overnight and additional performance and safety testing was conducted the following day. The ERH treatability study system was deemed fully operational on May 24, 2006, and the project status moved from the start-up phase to the operations phase. During ERH start-up and early operations, step-and-touch voltage potentials in and around the electrode field were monitored frequently to make sure that public and worker safety from electrical hazards was maintained.

When the applied voltage to the subsurface was raised to 240 volts, step-and-touch voltage readings that were nearing the established 15-volt limit were obtained on the perimeter fence in the vicinity of electrodes H3 and H4. To address this concern, a portion of the metal fence along Sampson Street was replaced with a wooden panel fence that extended 15 feet north and south of electrode row “H”. As an additional precaution, the concrete and asphalt extending 3 feet on either side of the wooden fence were painted with an isolating dielectric paint. The wooden fence eliminated potential voltage hazards from ground to the fence, and the paint insulated the surface from the pavement underneath. To monitor surface voltages over time, step-and-touch readings in and around the entire electrode field were collected during the site visits. These efforts were taken to make sure on-going site safety.

Additionally during the start-up procedures, multiple noise measurements were obtained throughout the vicinity of the site to make sure that the Base noise limits were not exceeded and that the operation of the system did not effect personnel at the fire station across Sampson Street. These readings, and conversations with the fire station personnel, indicated that there were no issues with noise.

Except for brief periods of shut down for soil sampling and maintenance, the ERH treatability study system operated continuously through October 4, 2006; operation of the VR system continued through October 16, 2006, to recover additional vapor created in the heated soil. Energy input was adjusted throughout the system operation based on vapor recovery and soil sampling data to optimize system performance. The amount of energy utilized was 632,866 kilowatt-hours over 19 weeks of operation. More information on system operation is presented in the TRS Final Report (Appendix A).

During operation of the ERH treatability study system, data were obtained to determine the system's success in obtaining the goals of the study. Section 2.4 describes the data collection, and Section 3.0 discusses the results.

2.3.4 System Demobilization and Site Restoration

Following shut down of the VR system on October 16, 2006, system demobilization activities began. The Power Control Unit, steam condenser, VR blower, and cooling tower were removed from the site on October 19, 2007 (the GAC and excess water tank had been removed from the site in August 2006). Additionally, the electrodes were abandoned and the piping from the VR and drip piping systems and electrode well heads were decontaminated and disposed as construction/demolition debris.

During the week of November 6, 2006, site restoration activities were completed. The site fencing and electrical transformer were removed, and the asphalt, concrete, and grass surfaces were restored to pre-existing conditions (see Appendix A for more details).

2.3.5 Remediation-Derived Waste Disposal

Several waste streams were generated during the treatability study. The following summarizes the disposition of each of these streams:

- Purge and decontamination water from the initial pre-remediation sampling event (15 gallons) were disposed at Pollution Control Industries in East Chicago, Indiana, as F002 listed hazardous waste on February 10, 2006.

- Soil from the installation of the electrodes and TMPs (15.7 tons) was disposed as listed F002 hazardous waste at Pollution Control Industries in East Chicago, Indiana on May 9, 2006.

- Soil from the reinstallation of monitoring wells following remediation (10 drums) was disposed as listed F002 hazardous waste at Pollution Control Industries in East Chicago, Indiana on March 14, 2007.

- Water from the cooling tower, equipment decontamination, and monitoring well development and purging (four drums) was disposed as non-hazardous waste at Pollution Control Industries in East Chicago, Indiana on March 14, 2007. Due to site remediation activities, this water was not considered listed waste, and the cVOC concentrations were significantly less than the threshold for characteristic waste.

Waste manifests for each of these streams are included in Appendix C.

2.4 DATA COLLECTION FOR EVALUATION OF ERH TREATABILITY STUDY SYSTEM

As stated in Section 1.4, the following four criteria were used to evaluate the effectiveness of the ERH treatability study system at Site 22:

- Ability of the system to achieve and maintain temperatures of 90 degrees Celsius throughout the treatment volume. The temperature profile in the subsurface has been shown to be the most important metric in determining the success of treatment via ERH (Batelle, 2006).

- Ability of the system to remove a significant amount of the site cVOC mass via the recovered vapor stream.

- Ability of the system to reduce average total cVOC concentrations in subsurface soil by 95.5 percent, to an average of 20 mg/kg or less.

- Ability of the system to reduce pore water cVOC concentrations at the site. Because LUCs currently in place at Naval Station Great Lakes prevent pore water use, no specific pore water reduction goals were set.

The sections below detail data collection activities associated with evaluating the ERH treatability study system with respect to these goals. The success of the system in meeting the stated goals is evaluated in Section 3.0.

2.4.1 Temperature Monitoring

As stated above, the temperature of the subsurface was measured throughout the treatment area. One TMP, with thermocouples installed at multiple depths, was installed in each section of the treatment area. The TMPs were placed in areas nearly equidistant from the surrounding electrodes to provide conservative temperature data. The TMPs and thermocouples were placed as follows (Figure 1 of Appendix A):

- Treatment in the northeastern corner of the site, Area 1, extended to approximately 25 feet. Thermocouples in the Area 1 TMP were placed at 1, 5, 10, 15, 20, and 25 feet bgs.

- The central portion of the site was designated as Area 2. In this area, temperature monitoring depths were set at 1, 5, 10, 15, and 18 feet bgs.

- Temperature monitoring depths in Area 3 (the western portion of the treatment area) were established at 1, 5 and 8 feet bgs.

Temperature data from the thermocouples were processed continuously. The data were then graphed to provide a simple method of analyzing temperature trends throughout the treatment volume. An evaluation of the success of the ERH treatability study system in achieving and maintaining temperatures of 90 degrees C in the subsurface is presented in Section 3.1.

2.4.2 Vapor Stream Sampling

Soil vapor and steam were continuously removed from the subsurface during ERH treatability study system operation. The steam was then condensed, and the resultant water stream was then cooled and reinjected in to the annular space of the electrodes to maintain moist/conductive conditions in the graphite/steel shot backfill. The remaining vapor stream was then cooled and discharged to the atmosphere. Periodic monitoring of the vapor stream was conducted to:

- Make sure that the maximum permitted rate of uncontrolled cVOC emissions of 8 pounds per hour was not exceeded. If the discharge rate had approached that value, the stream would have been passed through the granular activated carbon system prior to discharge. Since the discharge rate stayed well below this value, the granular activated carbon was not utilized.

- Provide data to estimate cVOCs removed via the ERH treatability study system.

- Determine when vapor recovery had reached an asymptotic level and continued operation of the system would lead to minimal additional cVOC recovery.

To allow a general evaluation of vapor recovery and the third criterion above, measurements of the cVOC concentration of the vapor stream were obtained with a photoionization detector (PID). These measurements were obtained three to four times a week during the first 4 weeks of system operation and approximately weekly thereafter. Vapor stream samples were collected in Tedlar bags for laboratory analysis on an approximately weekly basis for the first 13 weeks of operation to provide more quantitative data to evaluate the performance criteria. These samples were analyzed by Test America Analytical Testing Corporation (Buffalo Grove, Illinois) for cVOCs via U.S. EPA Method 8260B.

Results of the vapor stream monitoring and sampling and achievement of the related site goals are presented in Section 3.2.

2.4.3 Soil Sampling

Following the start of remedial activities at the site, soil sampling activities were conducted periodically to determine the reductions in soil concentrations throughout the site to optimize system performance and to determine when remedial activities were considered complete. During these performance sampling events, the soil samples were collected as closely as possible to the locations and depths of the respective pre-remediation samples. The following summarizes these events:

- The first performance sampling event took place on July 11, 2006, as proposed in the ERH Work Plan (TtNUS, 2006b), after it was estimated that remediation was approximately 70 percent complete based on power consumption. Samples were collected from the 15 pre-remediation locations and depths.

- The second event took place on August 8, 2006. Samples were collected from the five locations and depths exhibiting the highest concentrations of cVOCs during the July sampling event.

- The third event took place on September 12, 2006. Because this was expected to be the final sampling event, a full round of 15 samples was collected.

- The fourth and final event took place on September 28, 2006. This event included the three locations and depths that exhibited elevated concentrations during the September 12 event.

During each performance sampling event, the soil samples were collected utilizing the protocol from the ERH Work Plan and site-wide Quality Assurance Project Plan. The samples were laboratory analyzed at Severn Trent Laboratory in Canton, Ohio, for cVOCs via U.S. EPA Method 8260B. The results of the performance soil sampling and achievement of the related site goals are presented in Section 3.3. Field logs from these sampling events are provided in Appendix D.

2.4.4 Pore Water Sampling

Following completion of the ERH treatability study, three of the abandoned monitoring wells (Section 2.3.2) were reinstalled. Reinstallation of these wells was delayed until March 6 and 7, 2007 to allow the soil to cool sufficiently for the use of polyvinyl chloride wells in the subsurface. Following installation, the locations and elevations of the monitoring wells were surveyed by James Anderson Company (Appendix E). Pore water samples were collected from these wells on March 10, 2007, via low-flow sampling techniques per the protocol in the ERH Work Plan and site-wide Quality Assurance Project Plan. The samples were laboratory analyzed at Severn Trent Laboratory in Canton, Ohio, for cVOCs via U.S. EPA Method 8260B.

The results of the pore water sampling and achievement of the related site goals are presented in Section 3.4. Field logs from the pore water sampling event are provided in Appendix D.

TABLE 2-1

SUMMARY OF PRE-TREATABILITY STUDY SOIL SAMPLE RESULTS
SITE 22 - BUILDING 105 OLD DRY CLEANING FACILITY
NAVAL STATION GREAT LAKES, ILLINOIS

Sample No.	Rationale for Sample Location	Depth from Surface (feet)	Depth from Top of Native Soil (feet)	PCE (μg/kg)	TCE (μg/kg)	cis-1,2-DCE (μg/kg)	VC (μg/kg)	Total cVOCs[a] (μg/kg)
NTC22SB200203	Confirm historical concentrations at GL95-105S-13	6 - 7	2 - 3	26,000	ND (f)	ND	ND	26,000
NTC22SB200506	Delineate depth at historical boring GL95-105S-13	9 - 10	5 - 6	ND	ND	ND	ND	ND
NTC22SB2102	Provide additional baseline data in remediation area	8 - 9	1 - 2	9,300	1,800	5,800	ND	16,900
NTC22SB210405	Provide additional baseline data in remediation area	11 - 12	4 - 5	160,000	10,000	13,000	ND	183,000
NTC22SB211112	Provide additional baseline data in remediation area	18 - 19	11 - 12	ND	ND	ND	ND	ND
NTC22SB220203	Provide additional baseline data in remediation area	9 - 10	2 - 3	19,000	ND	ND	ND	19,000
NTC22SB220708	Provide additional baseline data in remediation area	14 - 15	7 - 8	ND	ND	ND	ND	ND
NTC22SB221112	Provide additional baseline data in remediation area	18 - 19	11 - 12	200,000	ND	ND	ND	200,000
NTC22SB230102	Confirm historical surface sample at GL95-105S-8	4 - 5	0 - 1	400	ND	ND	ND	400
NCT22SB230203	Confirm historical surface sample at GL95-105S-8	6 - 7	2 - 3	1200	ND	ND	ND	1,200
NTC22SB240102	Confirm historical surface sample at GL95-105S-2	5 - 6	1 - 2	720	ND	ND	ND	720
NTC22SB240203	Confirm historical surface sample at GL95-105S-2	6 - 7	2 - 3	1,200	ND	ND	ND	1,200
NTC22SB250102	Confirm historical surface sample at GL95-105S-10	5 - 6	1 - 2	2,800	ND	ND	ND	2,800
NTC22SB250203	Confirm historical surface sample at GL95-105S-10	6 - 7	2 - 3	ND	ND	ND	ND	ND

PCE - Tetrachloroethene
TCE - Trichloroethene
Cis-1,2-dichloroethene
VC - Vinyl chloride
ND - Non-detect
[a] CVOCs - Chlorinated volatile organic compounds (PCE, TCE, cis-1,2-DCE ,and VC)

TABLE 2-2

SUMMARY OF PRE-TREATABILITY STUDY AND HISTORICAL PORE WATER SAMPLE RESULTS
SITE 22 - BUILDING 105 OLD DRY CLEANING FACILITY
NAVAL STATION GREAT LAKES, ILLINOIS

PARAMETER	Illinois TACO Groundwater Ingestion Criterion	NTC22MW05S SAMPLE 8/11/2003	NTC22MW05S DUPLICATE 8/11/2003	NTC22MW05S SAMPLE 11/22/2005	NTC22MW06S SAMPLE 10/21/2003	NTC22MW06S SAMPLE 11/20/2005	NTC22MW06S DUPLICATE 11/20/2005	NTC22MW10S SAMPLE 10/25/2003	NTC22MW10S SAMPLE 11/20/2005	NTC22MW10D SAMPLE 10/24/2003	NTC22MW10D SAMPLE 11/20/2005
Chlorinated Volatiles (µg/L)											
CHLOROMETHANE	NC	1 U	1 U	1 U	2000 U	1400 U	1400 U	1 U	2 U	0.21 J	1 U
CIS-1,2-DICHLOROETHENE	70	1 U	1 U	1 U	2000 U	1400 U	1400 U	2.6	52	1 U	4
TETRACHLOROETHENE	**5**	0.58 J	0.55 J	1 U	59000	45000	43000	62	3.5 J	8.9	1 U
TRANS-1,2-DICHLOROETHENE	NC	1 U	1 U	1 U	2000 U	1400 U	1400 U	1 U	2 U	1 U	1 U
TRICHLOROETHENE	5	1 U	1 U	1 U	2000 U	1400 U	1400 U	1.3	2 U	1 U	1 U
VINYL CHLORIDE	2	1 U	1 U	1 U	2000 U	1400 U	1400 U	1 U	2 U	1 U	1.3

J = Result is estimated as a result of a value less than the reporting limit or a technical noncompliance.
U = Value is a nondetected result as reported by the laboratory and should not be considered present.
Shaded cells exceed the Illinois TACO Groundwater Ingestion Tier 1 criteria and Federal Maximum Contaminant Limits.
NC = No Criterion

TABLE 2-3

SUMMARY OF BASELINE TREATMENT AREA SOIL SAMPLE RESULTS
SITE 22 - BUILDING 105 DRY CLEANING FACILITY
NAVAL STATION GREAT LAKES, ILLINOIS

Sample No.	**Depth** (feet bgs)	**PCE** (μg/kg)	**TCE** (μg/kg)	**cis-1,2-DCE** (μg/kg)	**VC** (μg/kg)	**Total CVOCs**[a] (μg/kg)
NTC22SB20	6 - 7	26,000	ND	ND	ND	26,000
NTC22SB21	9 - 10	9,300	1,800	5,800	ND	16,900
NTC22SB21	13 - 14	160,000	10,000	13,000	ND	183,000
NTC22SB22	7 - 8	19,000	ND	ND	ND	19,000
NTC22SB22	18 - 19	200,000	ND	ND	ND	200,000
GL95-105S-13	2.5 - 3	1,500,000	ND	ND	ND	1,500,000
NTC22MW05S	0 - 1	190,000	ND	ND	ND	190,000
GL95-105S-12	0 - 0.5	370,000	ND	ND	ND	370,000
GL95-105S-12	2.5 - 3	600,000	ND	ND	ND	600,000
NTC22SB19	19 - 20	570,000	5,600	9,300	ND	584,900
TOL01-GP04	8 - 12	550,000	ND	820	ND	550,820
NTC22MW10D	9 - 11	130,000	1,300	1,700	ND	133,000
NTC22SB15	0 - 1	770,000	7,700	52,000	ND	829,700
NTC22SB15	11 - 12	590,000	ND	ND	ND	590,000
NTC22MW06D	7 - 8	870,000	7,300	9,100	ND	886,400
AVERAGE		**436,953**	**2,247**	**6,115**	**ND**	**445,315**

Notes:

PCE - Tetrachloroethene

TCE - Trichloroethene

cis-1,2-dichloroethene

VC - Vinyl chloride

ND - Non-detect

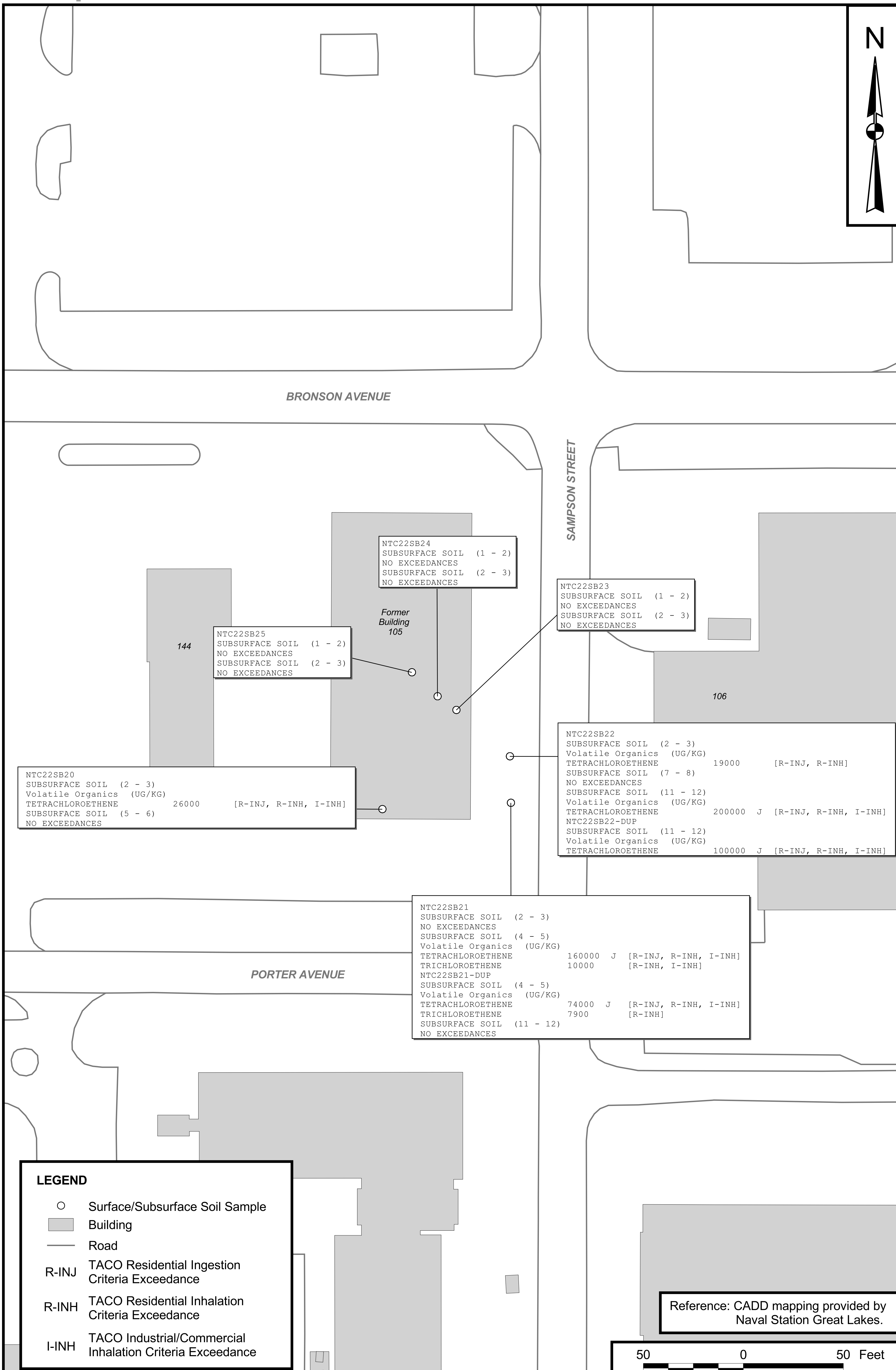
[a] CVOCs - Chlorinated volatile organic compounds (PCE, TCE, cis-1,2-DCE and VC)

TABLE 2-4

CHRONOLOGY OF FIELD EVENTS
SITE 22 - BUILDING 105 OLD DRY CLEANING FACILITY
NAVAL STATION GREAT LAKES, ILLINOIS

Date		Event	Description
Begin	End		
11/2005		Baseline Sampling	Baseline Soil Sampling Event
4/17/2006	5/8/2006	Construction of ERH System	Placement of surface equipment
4/24/2006	5/1/2006	Drilling and Electrode Installation	Drilled boreholes and installed each co-located electrode/VR well
5/1/2006	5/22/2006	System Connection	Surface piping and electrical connection
5/22/2006	5/23/2006	System Startup and Shakedown	Power was applied and tested
7/11/2006		Interim Soil Sampling	Round 1 Soil Sampling Event
8/8/2006			Round 2 Soil Sampling Event
9/12/2006			Round 3 Soil Sampling Event
9/28/2006			Round 4 Soil Sampling Event
10/4/2006	10/16/2006	System Shutdown	De-energized electrodes
11/4/2006	11/16/2006	Site Restoration	Restored site to its original condition
3/6/2007	3/10/2007	Monitoring Well Re-Installation and Sampling	Re-installed and sampled MW10D, MW10S, and MW06S that were abandoned as part of system installation activities

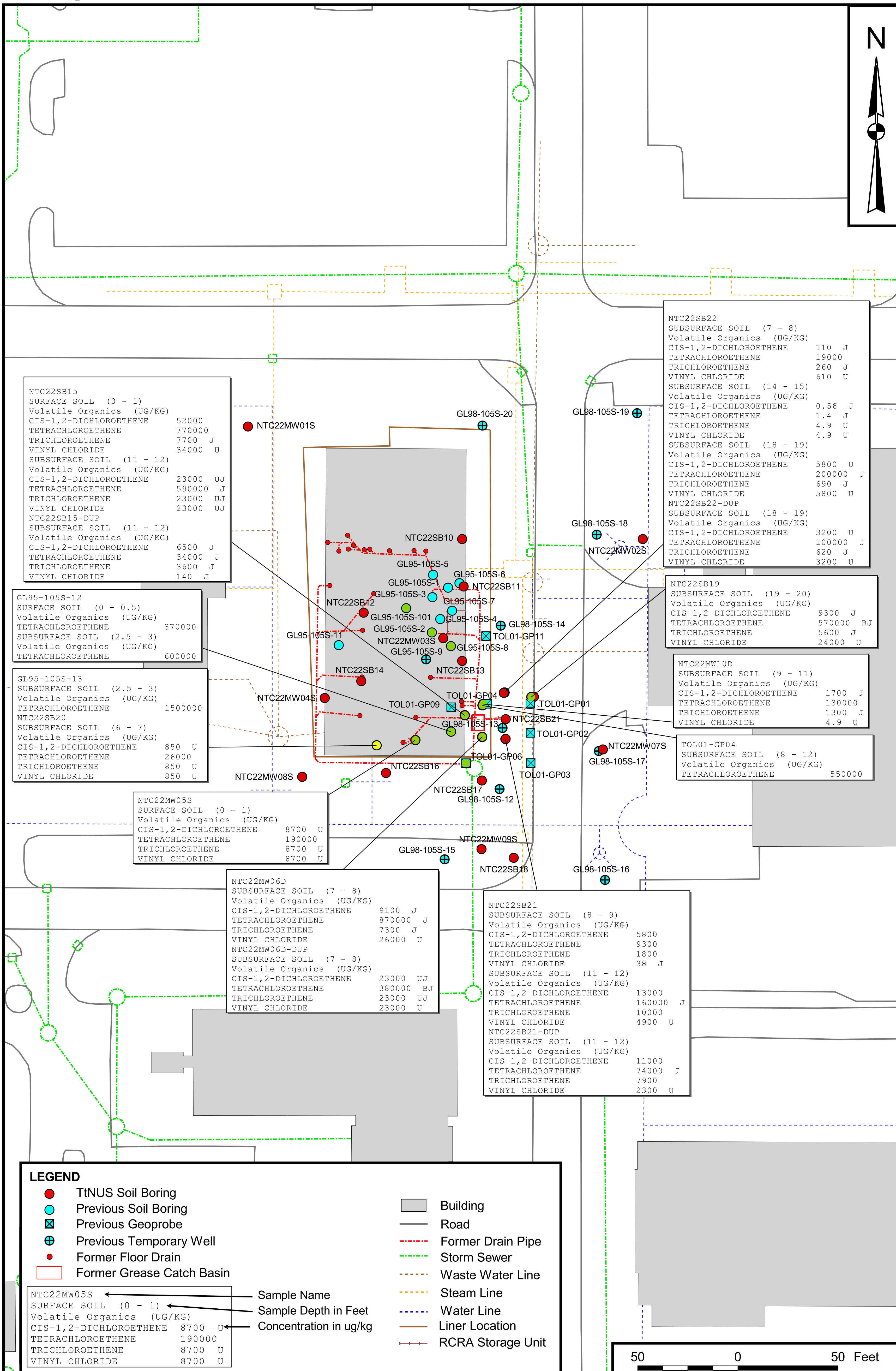
P:\GIS\GREATLAKES_NTC\APRS\BLDG105.APR SITE 22 ROUND 1 SO TAG LAYOUT 6/1/07 KM



DRAWN BY K. PEILA	DATE 8/17/05	PRE-REMEDIATION SAMPLING SOIL CONCENTRATIONS SITE 22 - BUILDING 105 OLD DRY CLEANING FACILITY NAVAL STATION GREAT LAKES GREAT LAKES, ILLINOIS	CONTRACT NUMBER 00202
REVISED BY K. MOORE	DATE 5/1/07		APPROVED BY RFD — DATE 5/1/07
CHECKED BY C. PIKE	DATE 6/1/07		APPROVED BY — DATE —
SCALE AS NOTED			DRAWING NO. FIGURE 2-1 — REV 0

NAVFAC

P:\GIS\GREATLAKES_NTC\APRS\BLDG105.APR PCE SOILS TAG LAYOUT - NOV 05 5/2/07 KM



DRAWN BY	DATE
C. SPEHAR	1/4/06
REVISED BY	DATE
K. MOORE	5/1/07
CHECKED BY	DATE
C. PIKE	5/2/07
SCALE	
AS NOTED	

NAVFAC

BASELINE SOIL CONCENTRATIONS

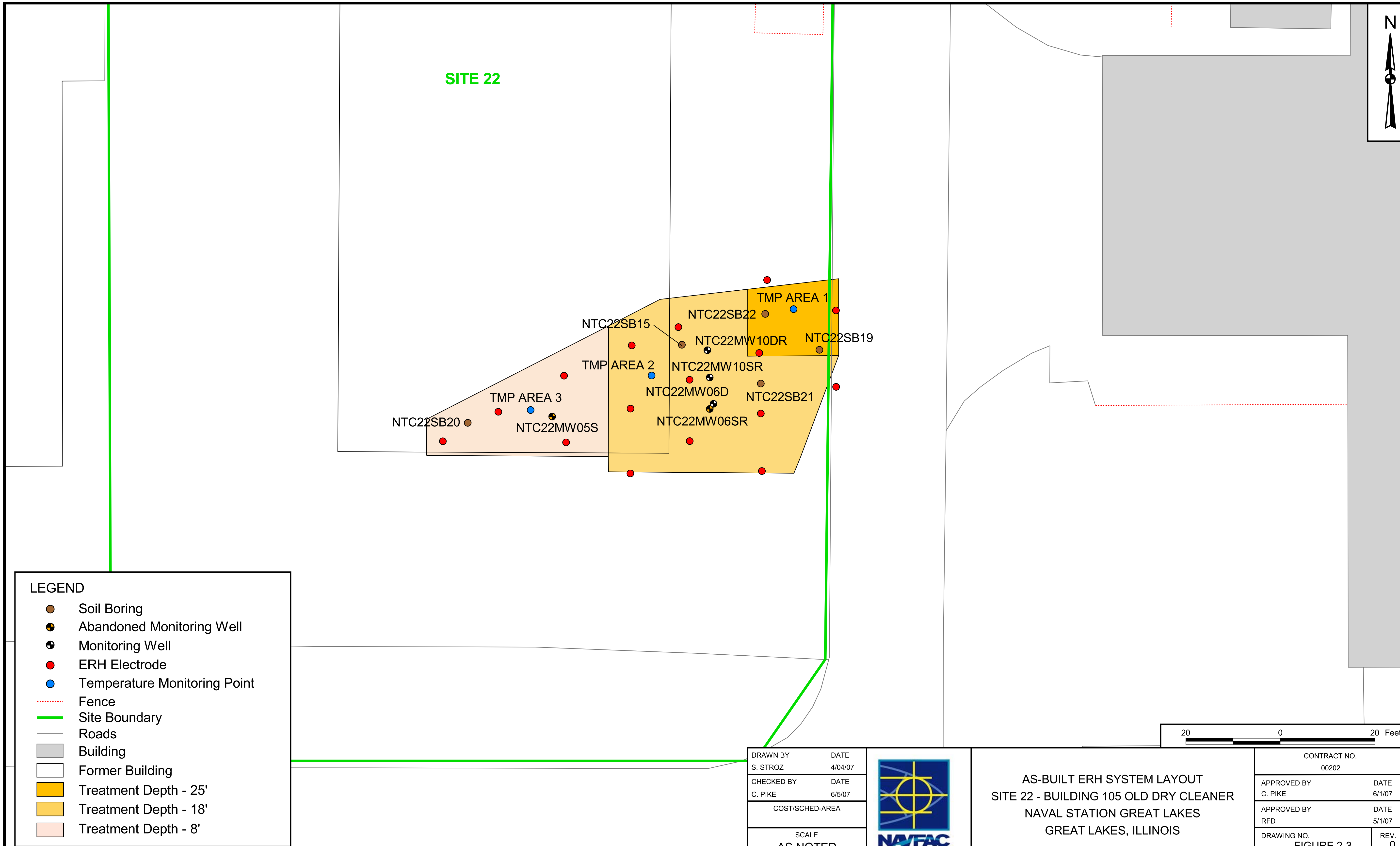
SITE 22 - BUILDING 105 OLD DRY CLEANING FACILITY

NAVAL STATION

GREAT LAKES, ILLINOIS

CONTRACT NUMBER	
00202	
APPROVED BY	DATE
RFD	5/1/07
APPROVED BY	DATE
__	__
DRAWING NO.	REV
FIGURE 2-2	0

P:\GIS\GREAT LAKES_NTC\APR\SITE22_LOCATIONS.APR SITE 22 LOCATIONS LAYOUT 6/5/07 KM



LEGEND

- Soil Boring
- Abandoned Monitoring Well
- Monitoring Well
- ERH Electrode
- Temperature Monitoring Point
- Fence
- Site Boundary
- Roads
- Building
- Former Building
- Treatment Depth - 25'
- Treatment Depth - 18'
- Treatment Depth - 8'

DRAWN BY S. STROZ	DATE 4/04/07	NAVFAC	AS-BUILT ERH SYSTEM LAYOUT SITE 22 - BUILDING 105 OLD DRY CLEANER NAVAL STATION GREAT LAKES GREAT LAKES, ILLINOIS	CONTRACT NO. 00202
CHECKED BY C. PIKE	DATE 6/5/07			APPROVED BY C. PIKE — DATE 6/1/07
COST/SCHED-AREA				APPROVED BY RFD — DATE 5/1/07
SCALE AS NOTED				DRAWING NO. FIGURE 2-3 — REV. 0

SITE PHOTOGRAPHS

Installation of Baker Tank

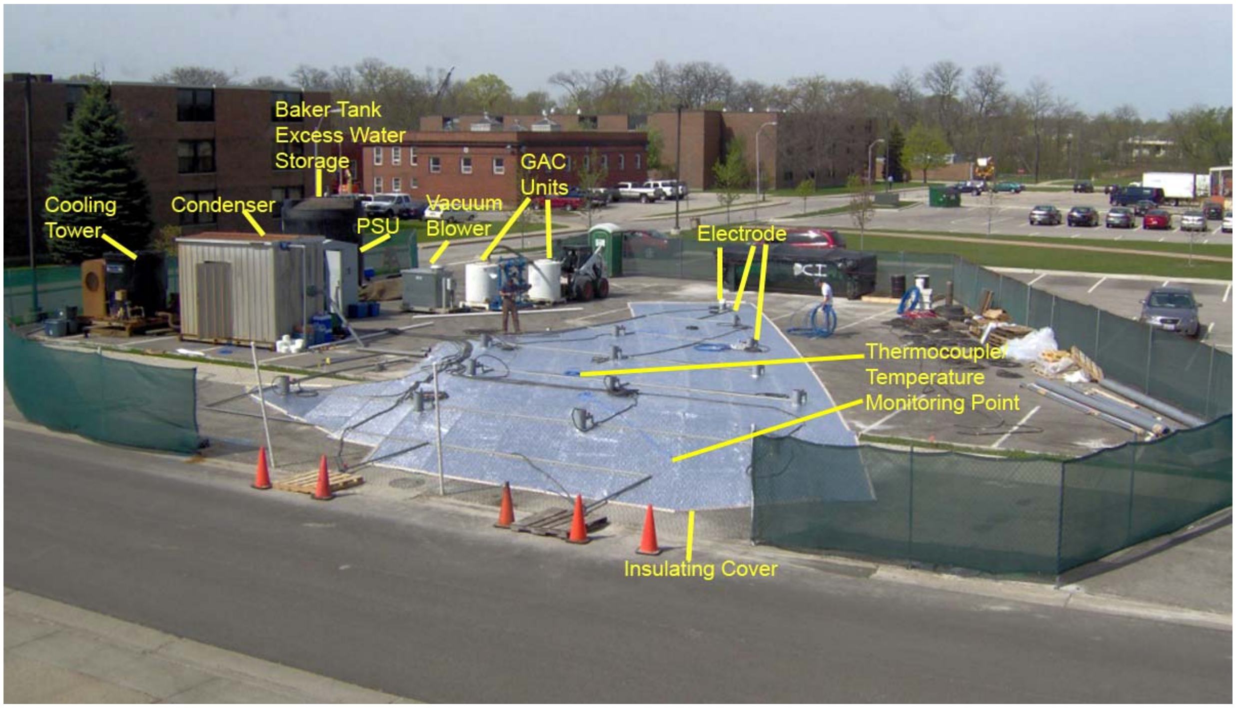
Drilling

Piping and Electrical Connection

Cooling Tower

Electrodes

Electrode Well Head



Site Layout and ERH System

Equipment

Wooden Fence Installed to Eliminate Step-and-Touch Voltage

Electrical Transformer and Breaker Panel

Interim Soil Sampling

Interim Soil Sampling – Close-up

3.0 TECHNOLOGY PERFORMANCE

The performance of the ERH treatability study was evaluated based on the collection and analyses of temperature, vapor, soil, and pore water data. This section includes a summary of the data and an assessment of the performance of the ERH system compared to the criteria in Section 2.4, specifically:

- Ability of the system to achieve and maintain temperatures of 90 degrees Celsius throughout the treatment volume.
- Ability of the system to remove a significant amount of the site cVOC contamination through the vapor stream.
- Ability of the system to reduce average cVOC concentrations in subsurface soil by 95.5 percent, to an average of 20 mg/kg or less.
- Ability of the system to reduce pore water cVOC concentrations at the site.

3.1 TEMPERATURE MONITORING RESULTS AND EVALUATION

As stated in Section 2.4, the subsurface temperature profile is the most important metric in determining whether an ERH system will effectively reduce contaminant concentrations at a site. To that end, the subsurface temperature was continuously monitored throughout the remedial process at Site 22. Figures 3-1 through 3-3 show the temperature profile versus depth over time for the three TMPs at the site. The maximum temperature reached at each depth interval is provided below (TRS, 2006); the average temperature in the subsurface prior to treatment was 15.5 degrees Celsius.

Depth (ft bgs)	Area 1 Maximum Temp (degrees C)	Area 2 Maximum Temp (degrees C)	Area 3 Maximum Temp (degrees C)
1	100	61	82
5	103	100	100
10	105	102	96
15	109	103	NA
20	103	NA	NA
25	81	NA	NA

As is evident from the data above, the target temperature of 90 degrees Celsius was achieved, exceeded, and maintained throughout the majority of the treatment area. The exceptions were the surface soil of Areas 2 and 3, and the 25-foot bgs interval of Area 1. The surface soil at Areas 2 and 3 did not reach the target temperature, primarily due to cooling at the surface (despite the presence of an insulating mat). This cooling did not affect system performance because the temperature increase was sufficient to aid in the volatilization and removal of contaminants from the high permeability fill just below the surface. The vacuum applied to this interval by the VR system also created a reduced boiling point for the PCE/water mixture at this interval, leading to contaminant reductions despite the lower temperatures.

The temperature at the deepest interval of Area 1 was also not a concern. The maximum depth at which contamination was identified was 20 feet bgs; the treatment zone was extended 5 feet deeper to account for cooling at depth. Therefore, the temperature of 103 degrees Celsius at 20 feet bgs in Area 1 represents the bottom of the contaminated zone.

Based on the data presented above, the temperature profile at the site exceeded the evaluation criteria for the study.

3.2 VAPOR SAMPLING RESULTS AND EVALUATION

As stated in Section 2.4.2, recovered vapor stream samples were periodically measured for VOC concentration via a PID and laboratory analyzed for cVOCs during treatability study system operation. The maximum PID reading was 596 parts per million (ppm) on June 27, 2006; this corresponds with the date of the collection of the sample with the maximum cVOC concentration as measured by the laboratory (1,290 µg/L). Figure 6 of the TRS Final Report (Appendix A) shows that although the magnitude of the concentrations was very different, the relative concentrations obtained by the PID and laboratory analyses were highly correlated throughout the operation of the system. A small peak in removal was observed at the end of May as the average subsurface temperature approached 35 degrees Celsius. A second, higher peak was observed during the June 27 sampling as the average subsurface temperature reached 80 degrees Celsius. Following collection of the August 1 vapor sample, cVOC concentrations in the recovered vapor decreased quickly. This indicated that the cVOC mass recovery of the system was becoming less efficient.

Table 3-1 summarizes the vapor data obtained from the analytical laboratory. This table also provides the air flow rate measured at the time of sampling, the calculated amount of cVOC mass removed during each period, and the cumulative cVOC removal. Based on the calculations, approximately 1,200 pounds of cVOCs were removed from the subsurface via the recovered vapor stream. The total cVOC mass in the subsurface prior to remediation was estimated at approximately 1,350 pounds (Tetra Tech, 2006a). This equates to an estimated removal of 89 percent of the cVOC mass via the recovered vapor stream. This was an acceptable percentage, especially considering the following:

- The potential error in the estimates of both the mass of cVOCs in the subsurface and the total cVOC removal.

- The estimate of initial cVOC mass included two surface and near-surface hot spots north of the treatment area that were subsequently shown to contain minimal contamination.

- Recovery via the VR system is only one mechanism (albeit the most prevalent) at work in reducing cVOC concentrations in the subsurface during ERH operation. Other mechanisms include increased hydrolysis and biodegradation occurring at higher temperatures.

- In conjunction with the soil sampling detailed below, the mass in the recovered vapor stream indicates substantial reduction in cVOC mass at the site.

Based on the data presented above, the vapor recovery at the site met the evaluation criteria for the study.

3.3 SOIL SAMPLING RESULTS AND EVALUATION

As stated in Section 2.0, soil samples were collected prior to treatability study activities, and four performance soil sampling events were conducted during treatability study operation. These soil samples were collected from approximately the same locations and depths as the 15 baseline samples designated to represent the treatment area (Table 2-3 and Figure 2-2). The average cVOC concentration of these samples was 445 mg/kg prior to remediation; the goal of the ERH system was to reduce the average concentration to less than 20 mg/kg. Data from the pre-remediation and post-remediation sampling events and associated percent reduction values are summarized in Table 3-2. A graph showing reductions in cVOC concentrations as remediation progressed is presented as Figure 3-4.

The first round of performance soil sampling, which consisted of collecting 15 samples, was conducted on July 11, 2006. The concentrations of total cVOCs ranged from 0.002 to 3,306 mg/kg. Concentrations in 7 of the 15 samples were reduced to less than the cleanup goal of 20 mg/kg, and concentrations in 11 samples exhibited significant reductions. A significant increase in concentration (from 585 to 3,305 mg/kg) was measured at NTC22SB19 (18 to 19 feet bgs); this increase may have been due to sampling variability associated with source material present in the backfill of the nearby sanitary sewer. The average total cVOC concentration from this sampling event indicated a 40-percent reduction in average concentration to 267 mg/kg. It was determined that the soil concentration reduction criteria had been achieved in portions of the treatment area, so the electrode field was reconfigured on July 20, 2006. Energy input to four electrodes in Area 3 (the most western electrodes) was discontinued to reduce the amount of energy being applied to areas that had achieved the soil concentration reduction criteria. Results from this sampling event are presented on Figure 3-5.

The second performance sampling event was scheduled for August 8, 2006. At this time, cVOC removal rates in the vapor stream were reduced from their highest levels, indicating that remediation was approaching completion. During this sampling event, five soil samples were collected from the locations and depths with the highest concentrations based on the first round of performance sampling. These samples included the four locations/depths not showing significant reductions and GL-95-105S013, which showed a significant reduction but still exhibited elevated cVOC concentrations. The concentrations of cVOCs in three of the five samples were reduced to less than 1 mg/kg, with another soil sample concentration reduced to 15.8 mg/kg. PCE soil concentrations in the fifth sample (SB-19 at 19 to 20 feet bgs) decreased by 69 percent but remained greater than 20 mg/kg, so the treatment operation was reconfigured to target just the northeastern portion of the treatment area. Including the five new results with the 10 results from the first round of sampling, the average cVOC concentration of the soil samples was calculated to be 77 mg/kg, equating to a reduction of 83 percent. Results from this sampling event are presented on Figure 3-6.

On August 3, 2006, it was determined that the connection between the Power Control Unit and electrode H3 had been lost and that the fault was within the 4-foot section of utility trenching extending from the site under Sampson Street to the electrode. After the soil analytical results from the second round of performance soil sampling indicated that the area surrounding electrode H3 was still impacted above the remedial goal, the electrode was repaired on August 15, 2006 and placed back in service.

A third round of performance sampling was conducted after a 95-percent reduction in the peak vapor stream concentrations of cVOCs had been achieved. During the third performance sampling event (September 12, 2006) the 15 soil samples from the approximate locations and depths of the baseline sampling event were resampled, with the results ranging from non-detect to 192 mg/kg, and 12 of 15 samples with concentrations less than 20 mg/kg, including SB19 (19 feet to 20 feet bgs). Three locations showed increases from previously low PCE concentrations. The average cVOC concentration was 25.2 mg/kg (94.3-percent reduction). This was slightly greater than the cleanup goal, so the electrode array was reconfigured to target the area of the three soil samples with remaining cVOC concentrations greater than the cleanup goal. Results from this sampling event are presented on Figure 3-7.

The fourth, and final, performance sampling event was completed on September 28, 2006. The three soil samples from the third round of performance sampling with remaining cVOC concentrations greater than the cleanup goal were resampled. The concentrations of each of the re-sampled soil samples were less than 20 mg/kg. Utilizing these sample results in conjunction with the other 12 samples from the third round of performance sampling, the average cVOC concentration for the samples was calculated to be 4.1 mg/kg, equating to an overall reduction of 99.1 percent. Results from this sampling event are presented on Figure 3-8.

This sampling event confirmed that the project goal for cVOC concentration reductions in site soil was exceeded (99.1-percent reduction versus a goal of 95.5-percent reduction). In fact, with a total cVOC concentration range between non-detect and 15.4 mg/kg, all sample concentrations were less than the cleanup goal for the average sample. Therefore, based on the data presented above, the soil concentration reductions at the site exceeded the evaluation criteria for the study.

3.4 PORE WATER SAMPLING RESULTS AND EVALUATION

As stated in Section 2.3.2, three monitoring wells located in the treatment area were abandoned prior to remediation and were reinstalled in March 2007. On March 10, 2007, approximately 6 months after the end of the ERH activities, samples were collected from the reinstalled wells (MW6S, MW10S, and MW10D). The results are summarized in Table 3-3.

Monitoring well MW-6S is a shallow well located within the treatment volume. The total cVOC concentration in this well was reduced from 45,000 µg/L to 17 µg/L. Monitoring wells MW-10S and MW-10D are screened in the deeper sand aquifer (30 to 40 feet bgs). The pore water total cVOC concentration for the sample from MW-10S (screened just below the clay/sand interface) decreased from 55.5 to 2.5 µg/L. The total cVOC concentration in MW-10D (screened at the bottom of the sand aquifer from 35 to 40 feet bgs) rose slightly from 5.3 to 17 µg/L Pore water analytical data are summarized in Table 3-3 and presented on Figure 3-9.

Based on the cVOC concentration reduction of greater than 99 percent for the monitoring wells within the treatment area, the pore water concentration reductions at the site met the evaluation criteria for the study.

3.5 ACHIEVEMENT OF STUDY GOALS

As detailed above, the following four evaluation criteria for the study were met or exceeded:

- The temperature goal of 90 degrees Celsius throughout the treatment volume was exceeded, with only a few exceptions that did not affect the overall system performance.

- Approximately 1,200 of 1,350 pounds (89 percent) of cVOC mass were removed in the vapor recovery stream; this meets the study goals of providing significant cVOC removal, especially considering the factors detailed in Section 3.2.

- The average total cVOC concentration in the soil samples were reduced to 4.1 mg/kg (99.1-percent reduction), exceeding the goal of 20 mg/kg (95.5-percent reduction). In fact, all individual soil samples exhibited concentrations less than 16 mg/kg, less than the goal of 20 mg/kg for the average sample.

- Pore water cVOC concentrations inside the treatment area were reduced 99 percent, meeting the goal of groundwater concentration reduction.

TABLE 3-1

SUMMARY OF SOIL VAPOR AND cVOC REMOVAL DATA
SITE 22 - BUILDING 105 OLD DRY CLEANING FACILITY
NAVAL STATION GREAT LAKES, ILLINOIS

Sample Date	**PCE** (µg/L)	**TCE** (µg/L)	**Flow Rate** (scfm)	**PID Reading** (ppm)	**cVOC (d) Removal Rate** (pounds)	**cVOCs Removed this period** (pounds)	**Avg. Subsurface Temp** (degrees C)
05/25/06	84.9	ND	210	12	0.07	1	17
05/31/06	1060	ND	210	319	0.83	64	31
06/07/06	854	ND	225	198	0.72	134	53
06/13/06	780	ND	198	260	0.58	93	65
06/21/06	1140	ND	205	383	0.88	139	76
06/27/06	1290	ND	261	596	1.26	152	81
07/05/06	1050	ND	209	400	0.82	204	86
07/18/06	460	11.2	205	146	0.36	184	86
08/01/06	399	ND	210	69	0.31	113	89
08/16/06	40	ND	205	35	0.03	63	88
08/30/06	67.1	3.62	193	27	0.05	14	8
09/07/06	Samples not Collected		191	20	0.04	9	77
09/21/06			230	23	0.04	13	84
10/04/06			202	21	0.04	13	93
10/16/06			205	4	0.01	7	71
					TOTAL	1,201	

Notes:

PCE - Tetrachloroethene

TCE - Trichloroethene

PID - Photoionization detector reading

cVOC - Chlorinated volatile organic compound

mg/L - Microgram per liter

scfm - Standard cubic feet per minute

ppm - Parts per million

C - Celsius

TABLE 3-2

SUMMARY OF SOIL PERFORMANCE SAMPLING DATA
SITE 22 - BUILDING 105 DRY CLEANING FACILITY
NAVAL STATION GREAT LAKES, ILLINOIS

Sample No.	Depth (feet bgs)	Total CVOCs[a] Baseline Sampling Nov 2005 (µg/kg)	1st Performance Sampling July 2006 (µg/kg)	2nd Performance Sampling Aug 7, 2006 (µg/kg)	3rd Performance Sampling Sept 11, 2006 (µg/kg)	4th Performance Sampling[b] Sept 28, 2006 (µg/kg)	Percent Reduction[c]
NTC22SB20	6 - 7	26,000	11,047	NS	3,391	NS	86.96
NTC22SB21	9 - 10	16,900	57,700	920	420	NS	97.51
NTC22SB21	13 - 14	183,000	221,000	780	1,370	NS	99.25
NTC22SB22	7 - 8	19,000	2.1	NS	0	NS	100.00
NTC22SB22	18 - 19	200,000	796	NS	62,400	15,074	92.46
GL95-105S-13	2.5 - 3	1,500,000	58,160	1	1,100	NS	99.93
NTC22MW05S	0 - 1	190,000	4,500	NS	640	NS	99.66
GL95-105S-12	0 - 0.5	370,000	20,580	NS	19,310	NS	94.78
GL95-105S-12	2.5 - 3	600,000	21,158	NS	3,230	NS	99.46
NTC22SB19	19 - 20	584,900	3,305,700	1,033,000	5	NS	100.00
TOL01-GP04	8 - 12	550,820	36,120	NS	4	NS	100.00
NTC22MW10D	9 - 11	133,000	350	NS	192,200	15,380	88.44
NTC22SB15	0 - 1	829,700	3,164	NS	215	NS	99.97
NTC22SB15	11 - 12	590,000	255,300	15,200	94,100	1,016	99.83
NTC22MW06D	7 - 8	886,400	2,522	NS	265	NS	99.97
AVERAGE		**445,315**	**266,540**	**76,676**	**25,243**	**4,095**	99.08

Notes:
a Total CVOCs - Chlorinated volatile organic compounds (PCE, TCE, cis-1,2-DCE and VC).
b Average calculated from 4th interim sample results for NTC22SB22, NTC22MW10D, and NTC22SB15 and 3rd interim sample results for all other samples.
c Percent reductions calculated from 4th interim sample results for NTC22SB22, NTC22MW10D, and NTC22SB15 and 3rd interim sample results for all other samples.
NS - Not sampled.

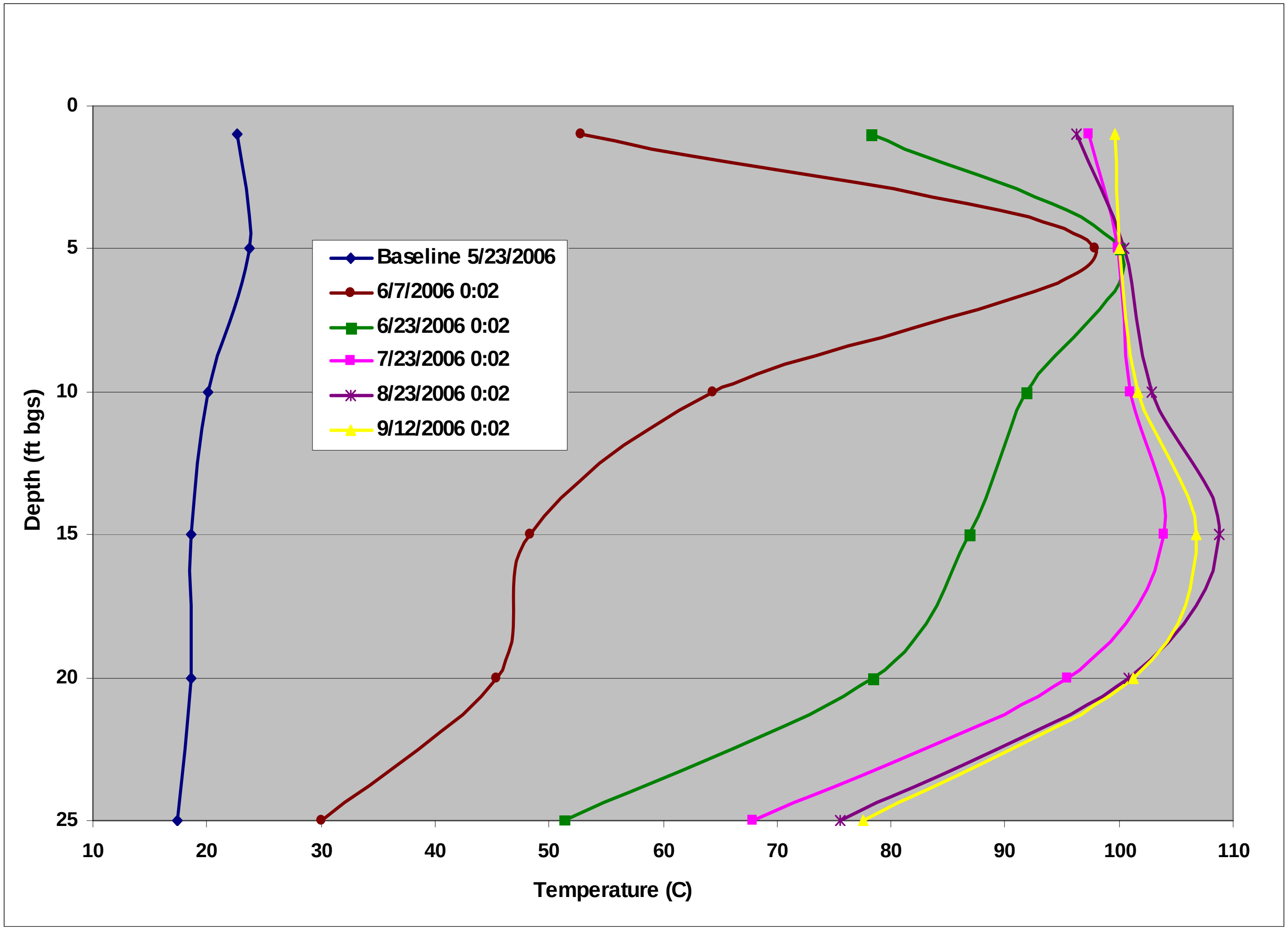
TABLE 3-3

SUMMARY OF PORE WATER DATA
SITE 22 - BUILDING 105 OLD DRY CLEANING FACILITY
NAVAL STATION GREAT LAKES, ILLINOIS

PARAMETER	**Illinois TACO Groundwater Ingestion Criterion**	NTC22MW06S 11/20/2005	NTC22MW06S 3/10/2007	NTC22MW10S 11/20/2005	NTC22MW10S 3/10/2007	NTC22MW10D 11/20/2005	NTC22MW10D 3/10/2007
Chlorinated Volatiles (ug/L)							
CHLOROMETHANE	NC	1400 U	0.38 J	2 U	1.0 U	1.0 U	1.0 U
CIS-1,2-DICHLOROETHENE	70	1400 U	2.3	52	1.3	4	0.21 J
TETRACHLOROETHENE	5	45000	9.2	3.5 J	1.0 U	1.0 U	16
TRANS-1,2-DICHLOROETHENE	NC	1400 U	1.0 U	2 U	1.0 U	1.0 U	1 U
TRICHLOROETHENE	5	1400 U	5.2	2 U	1.2	1.0 U	1.2
VINYL CHLORIDE	2	1400 U	1.0 U	2 U	1.0 U	1.3	1.0 U

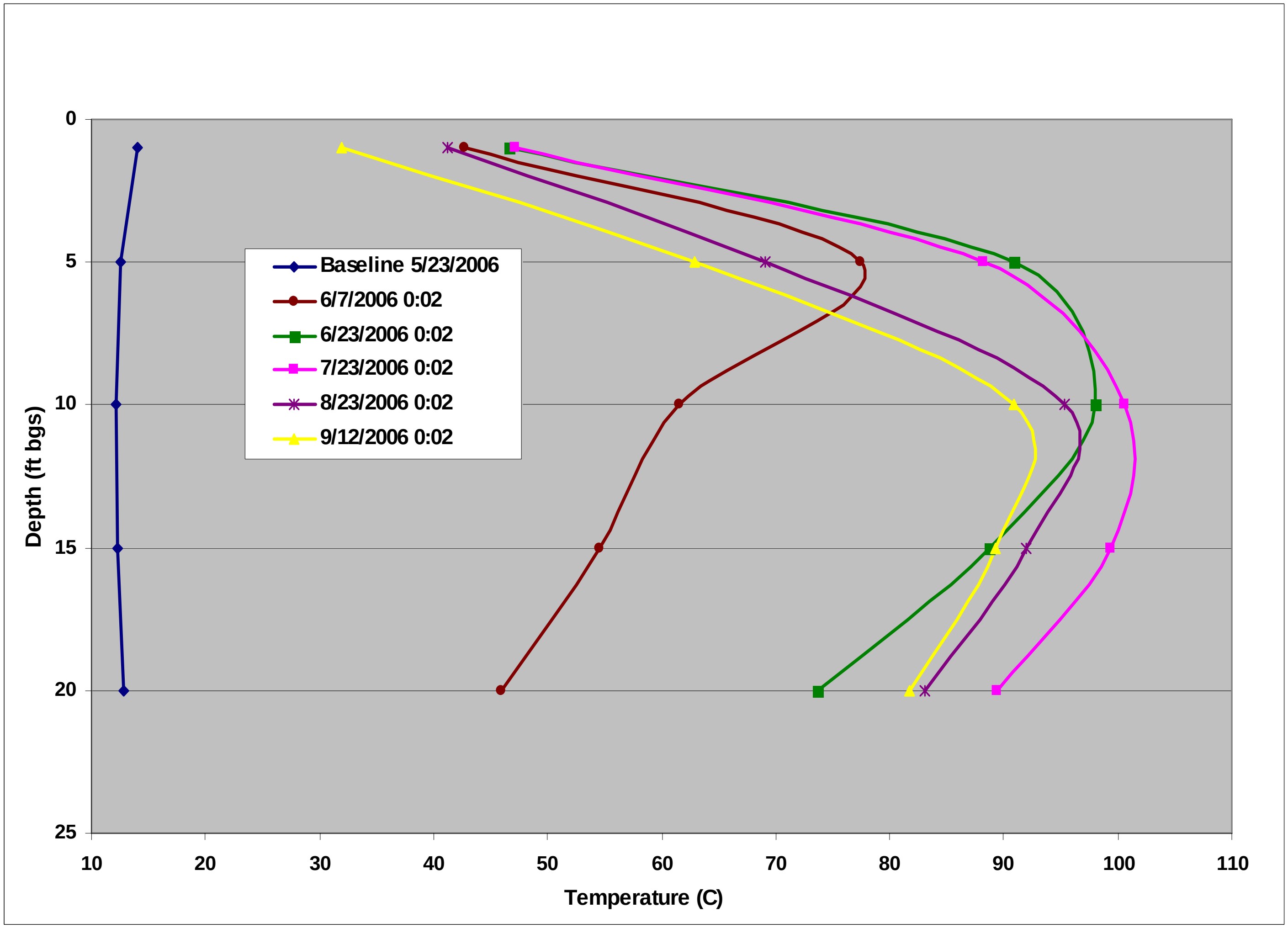
J = Result is estimated as a result of a value less than the reporting limit or a technical noncompliance.
U = Value is a nondetected result as reported by the laboratory and should not be considered present.
NC = No Criterion

P:GIS\GREAT_LAKES_NTC\MAPDOCS\MXD\SUBSURFACE_TEMP_AREA1.MXD 6/4/07 KM



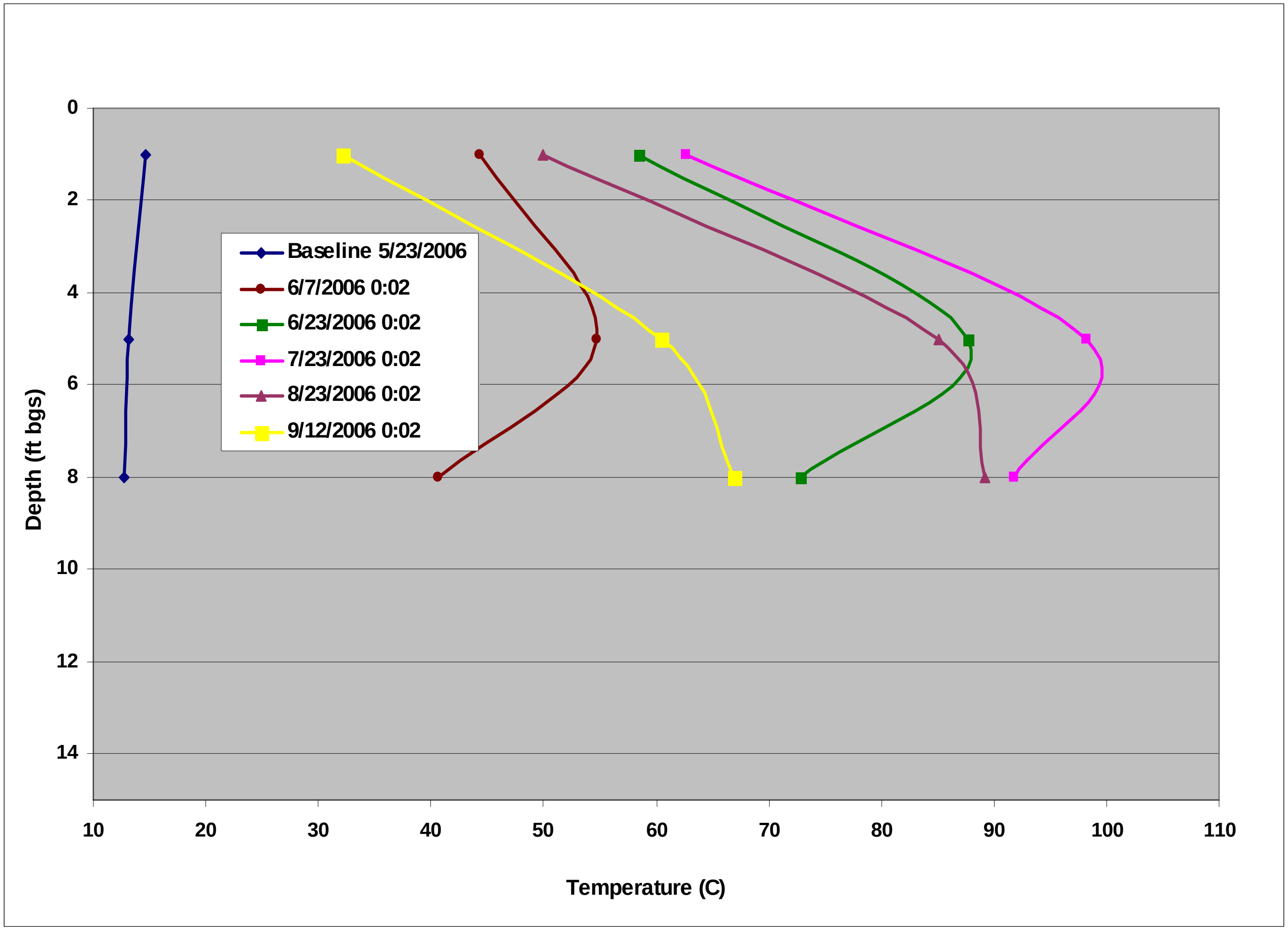
DRAWN BY K. MOORE	DATE 6/4/07	SUBSURFACE TEMPERATURE PROFILE - AREA 1 SITE 22 - BUILDING 105 OLD DRY CLEANING FACILITY NAVAL STATION GREAT LAKES GREAT LAKES, ILLINOIS	CONTRACT NUMBER 00202
CHECKED BY C. PIKE	DATE 6/4/07		APPROVED BY RFD — DATE 6/4/07
COST/SCHEDULE AREA			APPROVED BY ___ — DATE ___
SCALE AS NOTED			FIGURE NO. FIGURE 3-1 — REV 0

P:GIS\GREAT_LAKES_NTC\MAPDOCS\MXD\SUBSURFACE_TEMP_AREA2.MXD 6/4/07 KM



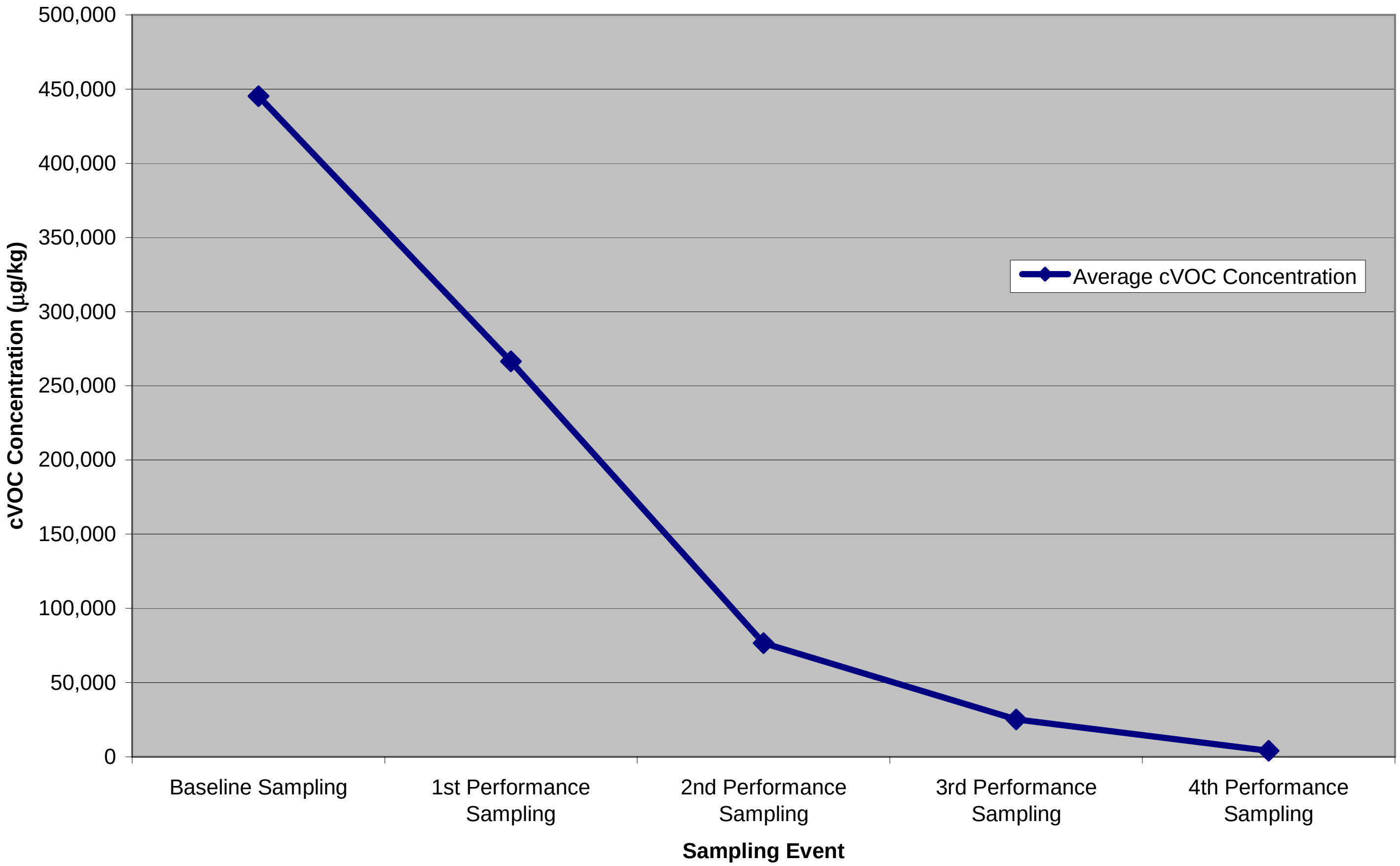
DRAWN BY K. MOORE — DATE 6/4/07	SUBSURFACE TEMPERATURE PROFILE - AREA 2	CONTRACT NUMBER 00202	
CHECKED BY C. PIKE — DATE 6/4/07	SITE 22 - BUILDING 105 OLD DRY CLEANING FACILITY	APPROVED BY RFD	DATE 6/4/07
COST/SCHEDULE AREA	NAVAL STATION GREAT LAKES	APPROVED BY ___	DATE ___
SCALE AS NOTED	GREAT LAKES, ILLINOIS	FIGURE NO. FIGURE 3-2	REV 0

P:GIS\GREAT_LAKES_NTC\MAPDOCS\MXD\SUBSURFACE_TEMP_AREA3.MXD 6/4/07 KM



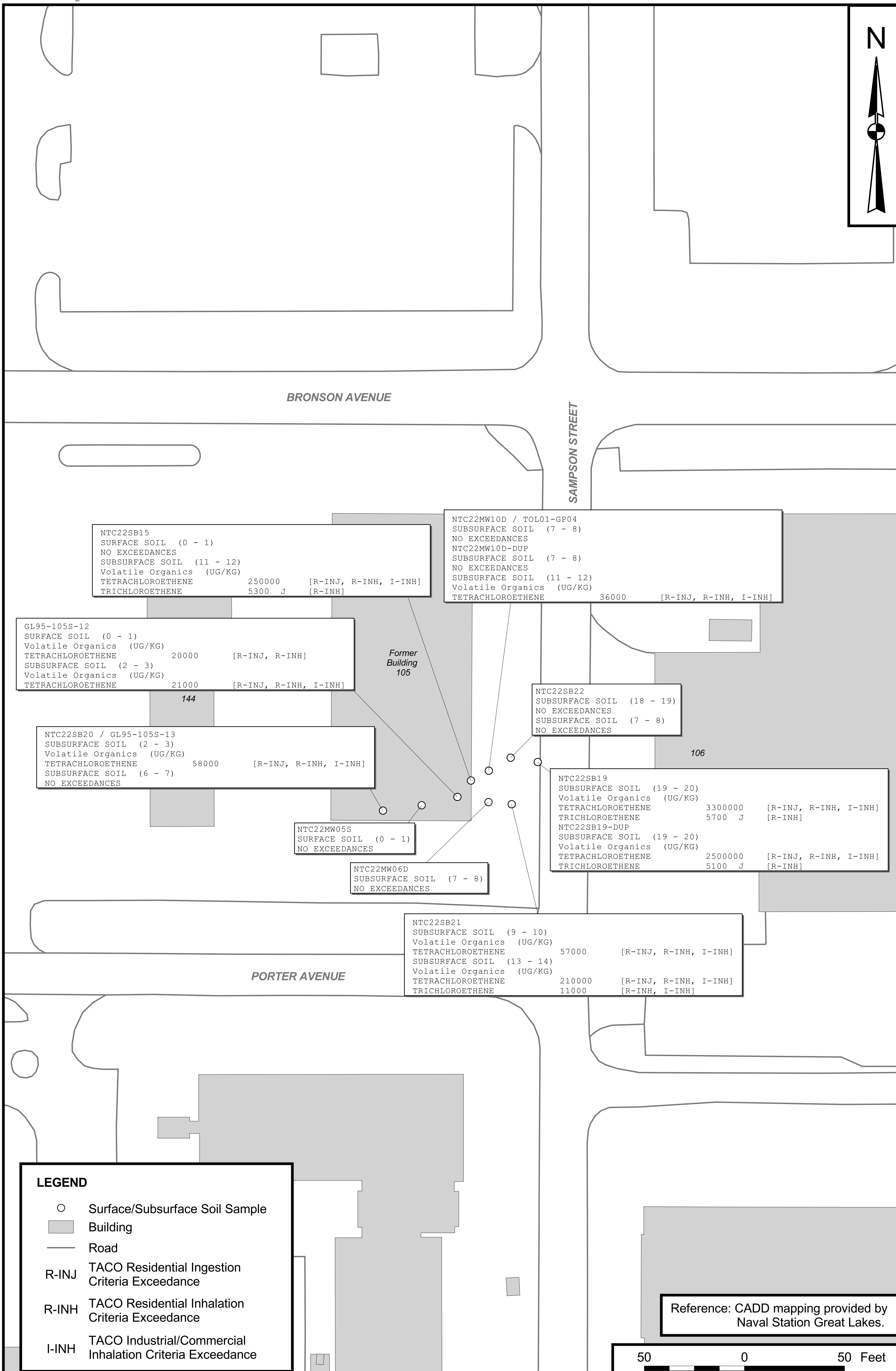
DRAWN BY K. MOORE / DATE 6/4/07	SUBSURFACE TEMPERATURE PROFILE - AREA 3	CONTRACT NUMBER 00202	
CHECKED BY C. PIKE / DATE 6/4/07	SITE 22 - BUILDING 105 OLD DRY CLEANING FACILITY	APPROVED BY RFD	DATE 6/4/07
COST/SCHEDULE AREA	NAVAL STATION GREAT LAKES	APPROVED BY ___	DATE ___
SCALE AS NOTED	GREAT LAKES, ILLINOIS	FIGURE NO. FIGURE 3-3	REV 0

P:GIS\GREAT_LAKES_NTC\MAPDOCS\MXD\SOIL_VOC_CONCENTRATIONS.MXD 6/4/07 KM



DRAWN BY K. MOORE — DATE 6/4/07	AVERAGE SOIL CVOC CONCENTRATIONS BASELINE AND PERFORMANCE SAMPLING SITE 22 - BUILDING 105 OLD DRY CLEANING FACILITY NAVAL STATION GREAT LAKES GREAT LAKES, ILLINOIS	CONTRACT NUMBER 00202	
CHECKED BY C. PIKE — DATE 6/4/07		APPROVED BY RFD — DATE 6/4/07	
COST/SCHEDULE AREA		APPROVED BY ___ — DATE ___	
SCALE AS NOTED		FIGURE NO. FIGURE 3-4	REV 0

P:\GIS\GREATLAKES_NTC\APRS\BLDG105.APR SITE 22 ROUND 2 SO TAG LAYOUT 5/1/07 KM



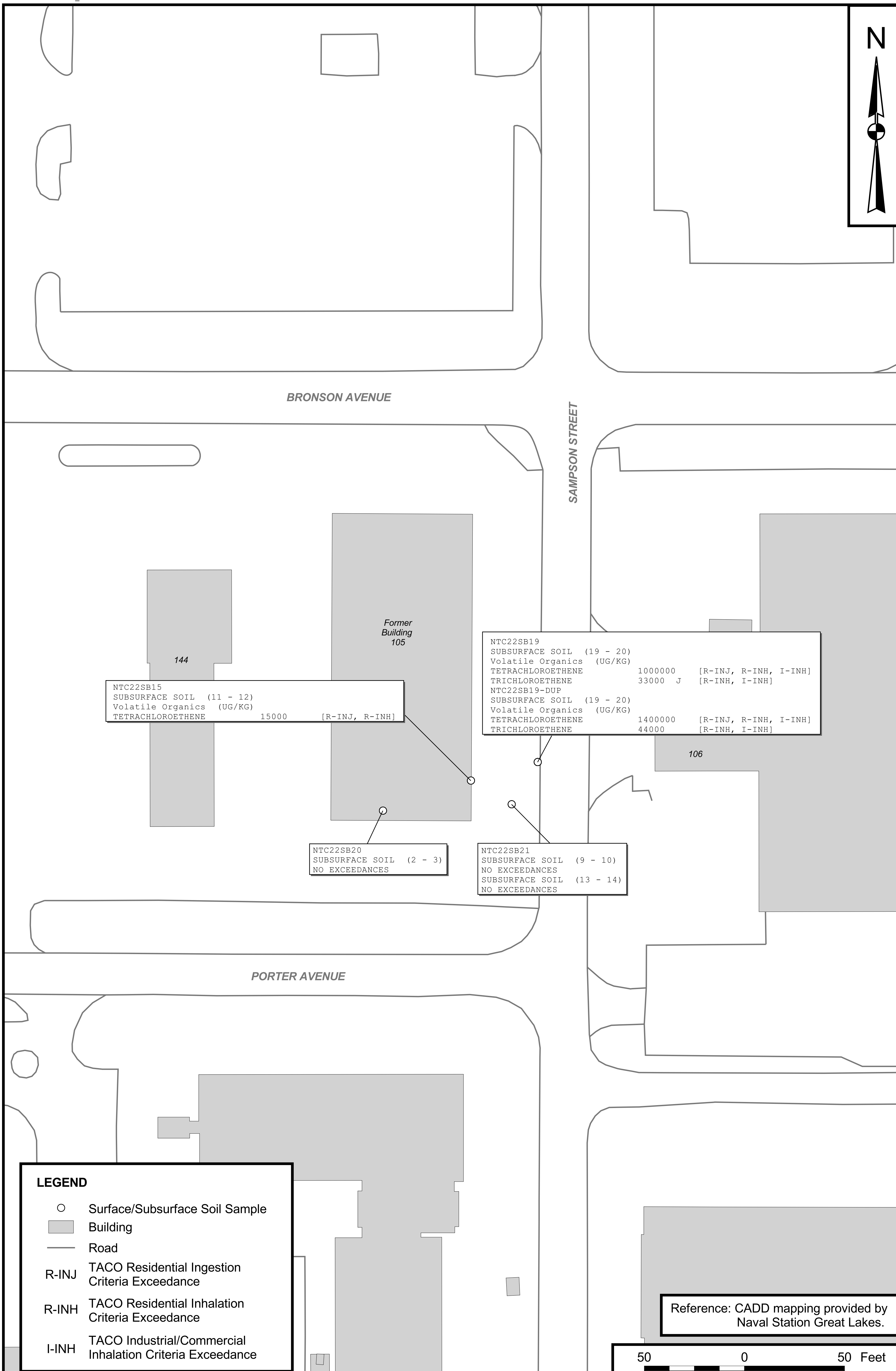
DRAWN BY	DATE
K. PEILA	8/17/05
REVISED BY	DATE
K. MOORE	5/1/07
CHECKED BY	DATE
C. PIKE	5/2/07
SCALE AS NOTED	

NAVFAC

SOIL SAMPLE CONCENTRATIONS
FIRST PERFORMANCE SAMPLING
SITE 22 - BUILDING 105 OLD DRY CLEANING FACILITY
NAVAL STATION GREAT LAKES
GREAT LAKES, ILLINOIS

CONTRACT NUMBER 00202		
APPROVED BY RFD	DATE 5/1/07	
APPROVED BY __	DATE __	
DRAWING NO.	FIGURE 3-5	REV 0

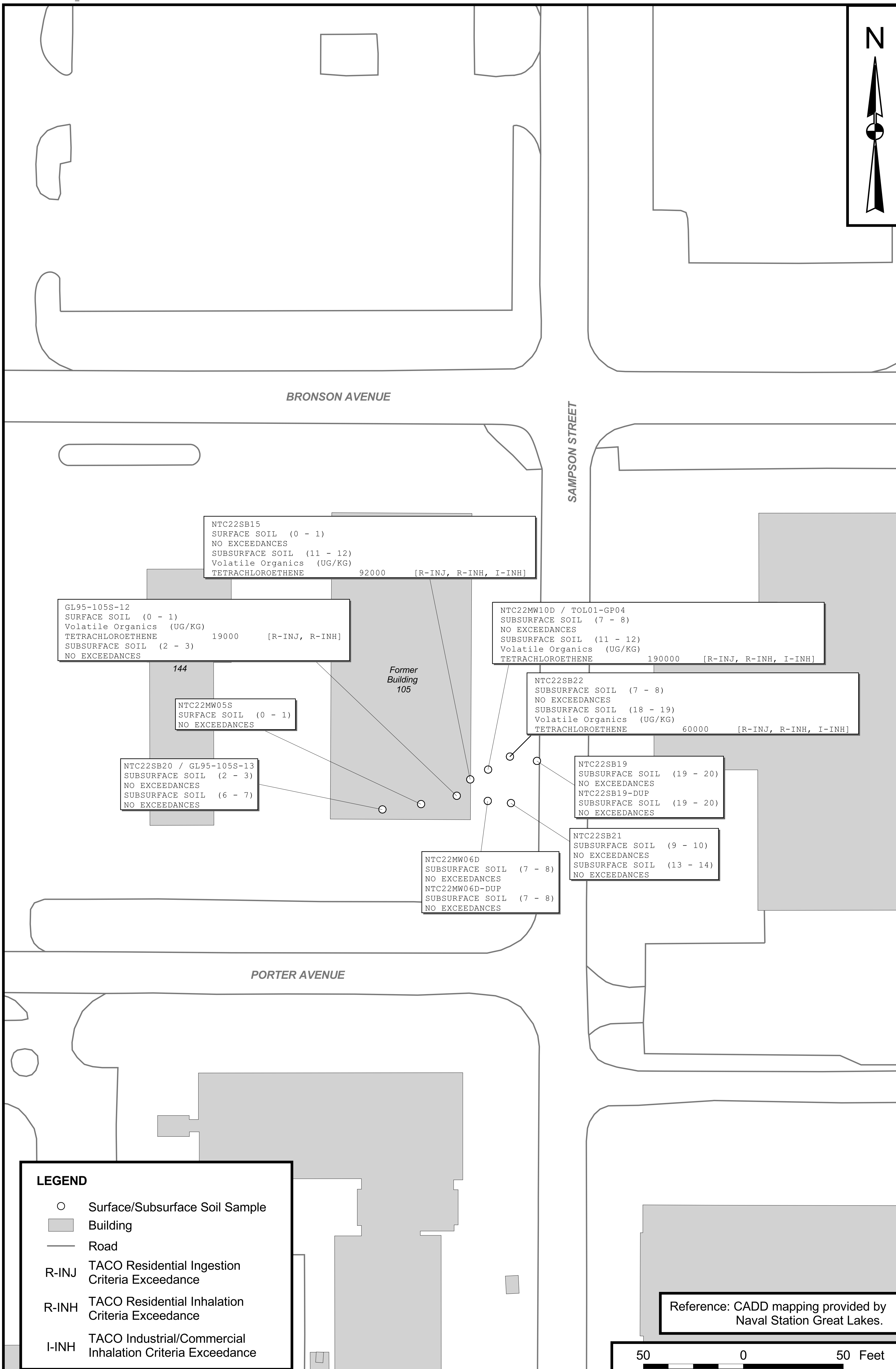
P:\GIS\GREATLAKES_NTC\APRS\BLDG105.APR SITE 22 ROUND 3 SO TAG LAYOUT 5/2/07 KM



DRAWN BY: K. PEILA	DATE: 8/17/05	SOIL SAMPLE CONCENTRATIONS	CONTRACT NUMBER: 00202
REVISED BY: K. MOORE	DATE: 5/1/07	SECOND PERFORMANCE SAMPLING	APPROVED BY: RFD, DATE: 5/1/07
CHECKED BY: C. PIKE	DATE: 5/2/07	SITE 22 - BUILDING 105 OLD DRY CLEANING FACILITY	APPROVED BY: __, DATE: __
SCALE: AS NOTED		NAVAL STATION GREAT LAKES	DRAWING NO.: FIGURE 3-6
		GREAT LAKES, ILLINOIS	REV: 0

NAVFAC

P:\GIS\GREATLAKES_NTC\APRS\BLDG105.APR SITE 22 ROUND 4 SO TAG LAYOUT 1/2/08 SS



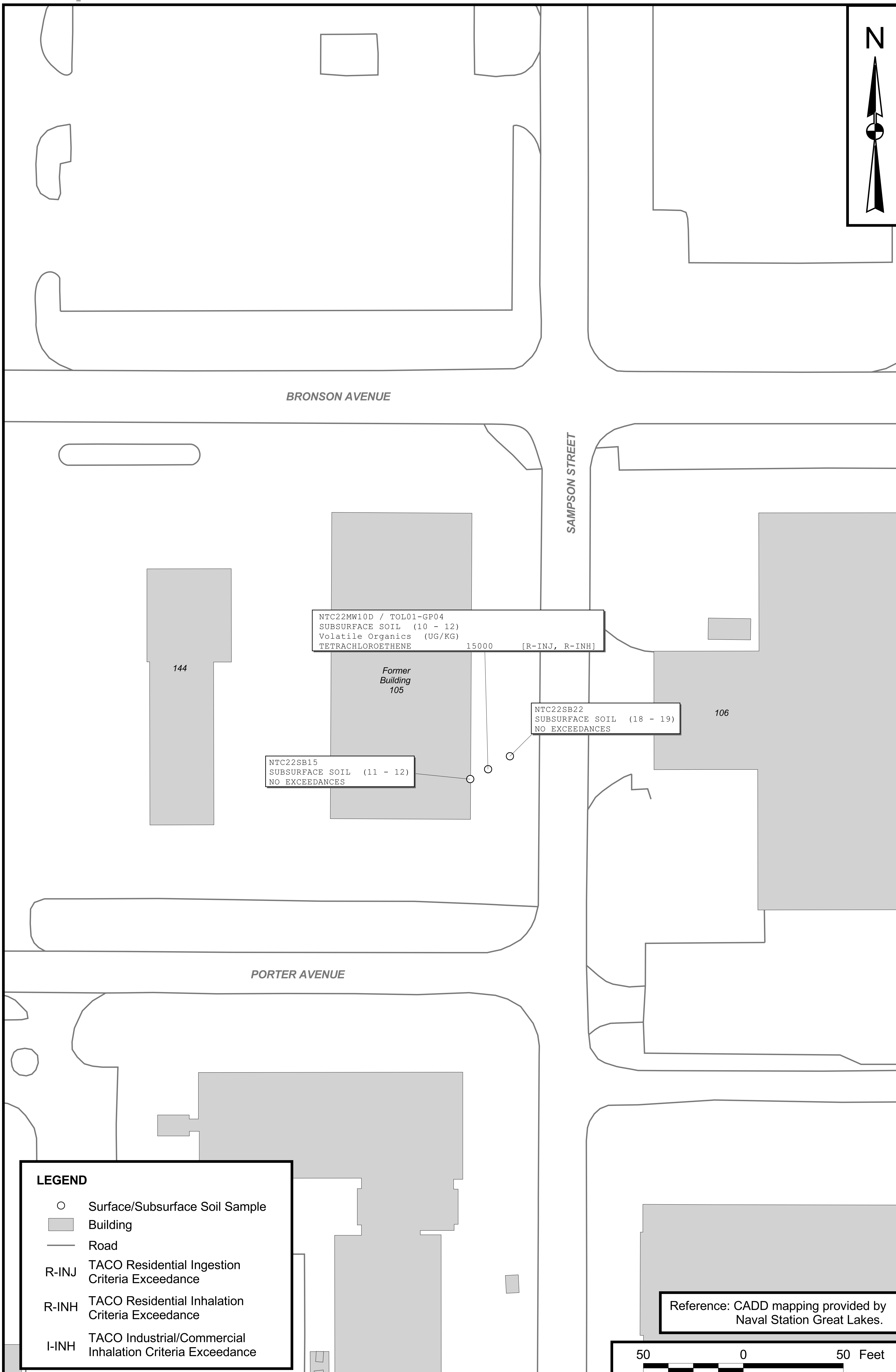
DRAWN BY	DATE
K. PEILA	8/17/05
REVISED BY	DATE
S. STROZ	1/2/08
CHECKED BY	DATE
C. PIKE	1/2/08
SCALE	
AS NOTED	

NAVFAC

SOIL SAMPLE CONCENTRATIONS
THIRD PERFORMANCE SAMPLING
SITE 22 - BUILDING 105 OLD DRY CLEANING FACILITY
NAVAL STATION GREAT LAKES
GREAT LAKES, ILLINOIS

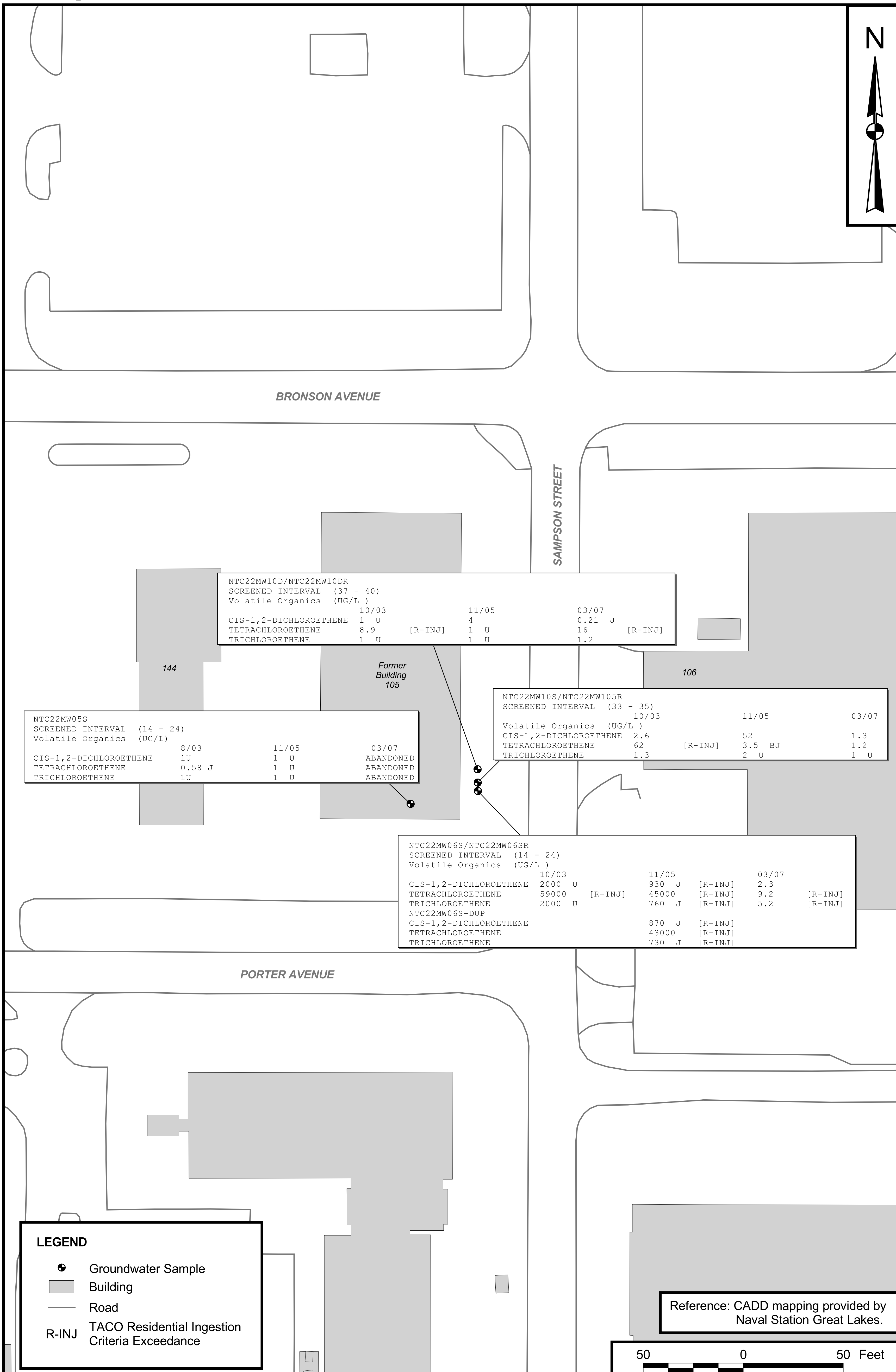
CONTRACT NUMBER	
00202	
APPROVED BY	DATE
RFD	5/1/07
APPROVED BY	DATE
__	__
DRAWING NO.	REV
FIGURE 3-7	0

P:\GIS\GREATLAKES_NTC\APRS\BLDG105.APR SITE 22 ROUND 5 SO TAG LAYOUT 6/1/07 KM



DRAWN BY K. PEILA	DATE 8/17/05	SOIL SAMPLE CONCENTRATIONS FOURTH PERFORMANCE SAMPLING SITE 22 - BUILDING 105 OLD DRY CLEANING FACILITY NAVAL STATION GREAT LAKES GREAT LAKES, ILLINOIS	CONTRACT NUMBER 00202
REVISED BY K. MOORE	DATE 5/1/07		APPROVED BY RFD — DATE 5/1/07
CHECKED BY C. PIKE	DATE 6/1/07		APPROVED BY — DATE —
SCALE AS NOTED			DRAWING NO. FIGURE 3-8 — REV 0

P:\GIS\GREATLAKES_NTC\APRS\BLDG105.APR SITE 22 GW TAG LAYOUT 6/5/07 KM



DRAWN BY	DATE
K. PEILA	8/17/05
REVISED BY	DATE
K. MOORE	5/2/07
CHECKED BY	DATE
C. PIKE	6/5/07
SCALE	
AS NOTED	

NAVFAC

PORE WATER SAMPLE CONCENTRATIONS
PRE AND POST TREATABILITY STUDY
SITE 22 - BUILDING 105 OLD DRY CLEANING FACILITY
NAVAL STATION GREAT LAKES
GREAT LAKES, ILLINOIS

CONTRACT NUMBER 00202	
APPROVED BY RFD	DATE 5/1/07
APPROVED BY —	DATE —
DRAWING NO. FIGURE 3-9	REV 0

4.0 HUMAN HEALTH RISK ASSESSMENT FOR POST-TREATMENT CONDITIONS

This section presents a human health risk evaluation of post-treatment soil and groundwater/pore water at Site 22. The risks were calculated using the same exposure equations, assumptions, and models employed in the RI/RA (TtNUS, 2004). A comparison of post-treatment and pre-treatment risks is also presented in this section.

4.1 DATA EVALUATION

Tables 4-1 and 4-2 present comparisons of compounds detected in post-treatment soil and groundwater/pore water samples with Illinois EPA TACO and U.S. EPA criteria. As shown in the tables, only the concentrations of PCE and trichloroethene exceeded one or more these criteria. Therefore, the post-treatment risk assessment evaluated risks for PCE and trichloroethene only.

4.2 EXPOSURE POINT CONCENTRATIONS

Exposure point concentrations (EPCs) were determined as in the RI/RA. If a data set consisted of less than 10 samples, the maximum detected concentration was used as the EPC. If a data set consisted of more than 10 samples, the 95-percent upper confidence limit (UCL) was used as the EPC. For the post-treatment risk evaluation, maximum concentrations were used as the EPCs for surface soil and groundwater/pore water. The 95-percent UCL was used as the EPC for subsurface soil. The post-treatment EPCs are as follows:

Surface Soil	Subsurface Soil	Groundwater/Pore Water
PCE – 19 mg/kg	PCE – 12 mg/kg	PCE – 16 μg/L
TCE – 0.2 mg/kg	TCE – 2 mg/kg	TCE – 5.2 μg/L

For purposes of comparison, the pre-treatment EPCs were as follows:

Surface Soil	Subsurface Soil	Groundwater/Pore Water
PCE – 770 mg/kg	PCE – 180 mg/kg	PCE – 59,000 μg/L
TCE – 7.7 mg/kg	TCE – 2 mg/kg	TCE – 1.3 μg/L

4.3 POTENTIAL RECEPTORS

Risks for the following potential receptors were evaluated in the post-treatment risk assessment:

- Construction workers
- Future full-time occupational workers
- Hypothetical future residents

4.4 EXPOSURE ROUTES AND PATHWAYS

The following exposure routes and pathways were quantitatively evaluated in the post-treatment risk assessment:

- Ingestion and dermal contact with surface and subsurface soil
- Inhalation of vapors from surface and subsurface soil (ambient air)
- Dermal contact with groundwater/pore water (construction workers only)
- Inhalation of vapors from groundwater/pore water (ambient air)
- Inhalation of vapors from groundwater/pore water by vapor intrusion (indoors)

Risks for vapor intrusion from soil into indoor air (based on soil concentrations) were not included in this evaluation because U.S. EPA in its Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance) recommends that this pathway not be evaluated "because of the large uncertainties associated with measuring concentrations of volatile contaminants introduced during soil sampling, preservation, and chemical analysis, as well as the uncertainties associated with soil partitioning calculations" (U.S. EPA, 2002).

Based on the results of the post-treatment sampling events, an exclusion to the Groundwater Ingestion Exposure Route, as provided in Subpart C of TACO, Part 742.320, applies at this site (i.e., groundwater ingestion is not included as an exposure route or pathway). As shown below, the requirements of items a) through f) of the exclusion in Part 742.320 are met:

- Part 742.320 a): The requirements of Subpart 742.300 and 742.305 are met; i.e., delineation of groundwater contamination has been obtained as shown in the RI (TtNUS, July 2004) and in this treatability study. No free product has been observed at the site during field activities.

- Part 742.320 b): As stated above, no free product has been observed at the site.

- Part 742.320 c): The source of the release is not within the minimum or designated setback zone or within a regulated recharge area of a potable supply well. As shown below, impact above drinking water standards does not migrate from the site. There are currently prohibitions on recovering water for potable use on Naval Station Great Lakes and potable water for Naval Station Great Lakes is obtained from Lake Michigan utilizing the Navy's drinking water treatment system. The surrounding communities are also connected to public water systems supplied by Lake Michigan. The City of North Chicago has its own treatment system. Other nearby communities, including Knollwood, Lake Bluff, Libertyville, Vernon Hills, Wildwood, and Gurnee, are supplied by the Central Lake County Joint Action Water Agency. Lake County provides an additional 20,000 customers with potable water from Lake Michigan. Shallow aquifers in the region (found at 150 to 500 feet bgs) often have poor quality water due to the presence of naturally occurring gas, oil, and hydrogen sulfide; the deep aquifer system (900 to 1,500 feet bgs) typically exhibits high yields of good quality water (Guernsey, 2002).

The closest public water supply well that could be located was greater than 10 miles from the site. A search of the Illinois State Geological Survey (ISGS) indicated one water well was located in the Township and Range of the site; the well is 210 feet deep and the owner is listed as Sager Lock Company. It does not appear that the company is still active at that location.

Although there may be some individual private supply wells in the vicinity that do not appear in the ISGS database, it is highly unlikely, based on the depth of impact at the site and the low permeability soil matrix, that the site is within a recharge area for such wells.

If additional information is required to meet this aspect of the exclusion, it will be provided in the ROD.

- Part 742.320 d): Groundwater contamination modeling was conducted to show that groundwater concentrations above Tier 1 groundwater remediation objectives are not present outside of an area where the local government has adopted an ordinance that effectively prohibits the installation of potable water supply wells. In this case, the equivalent of that ordinance is Instruction 11130.1 instituted by Naval Station Great Lakes that prohibits the installation of groundwater supply wells throughout Naval Station Great Lakes (Appendix G). Additionally, as part of the LUC Implementation Plan for the site, Site 22 will be added to the LUC Memorandum of Agreement between Naval Station Great Lakes and the Illinois EPA. A description of the modeling effort is included in Section 4.5. Because the modeling shows that the groundwater at the site boundary contains concentrations equal to or less than the Tier 1 objectives, this aspect of the exclusion is met.

- Part 742.320 e): Based on the information provided in response to c) and d) above, the concentrations within the setback zone for a potable water supply will meet Tier 1 objectives.

- Part 742.320 f): The modeling described in Section 4.5 indicates that the groundwater discharging into Lake Michigan will meet the applicable criteria.

4.5 GROUNDWATER MODELING

Groundwater modeling for PCE detected in post-treatment groundwater at Site 22 was conducted to determine exposure concentrations and potential drinking water risks at a point of compliance downgradient of the site. The model used to predict the concentrations was the modified Domenico transport equation that is listed as equation R26 in Appendix C, Table C, Part 742.810 of the Illinois Administrative Code (IAC). This equation calculates the concentration of a contaminant downgradient of a slab-type source of constant concentration after equilibrium in the system has been attained (i.e., plume has achieved full expansion). The modeling was based on the maximum PCE concentration detected in post-treatment groundwater at the site (16 µg/L at location NTC22MW10D). Site-specific data were used for most of the input parameters. These included:

- Source dimensions
- Soil porosity
- Hydraulic conductivity
- Hydraulic gradient
- Distance to exposure point

The chemical-specific First Order Degradation Constant for PCE was obtained from Table E in Appendix C of TACO. The input parameters for each model run are presented in Table 4-3 and model calculations are presented in Appendix H.

MODELING RESULTS

The results of six model simulations are summarized in Table 4-3. These include:

- Two simulations to the east of the source
- Two simulations to the west of the source
- Two simulations south of the source

Two simulations were run in each direction to estimate concentrations at the site boundary located approximately 75 feet from the source and at the facility boundary located approximately 1,300 feet from the source.

As shown in Table 4-3, the estimated concentration at the site boundary is 5 µg/L and meets the Tier 1 objective for PCE and the predicted concentration at the facility boundary is several orders of magnitude less than the Tier 1 objective in the three directions evaluated. Based on these modeling results, it can be concluded that groundwater will not transport PCE in concentrations that will adversely impact water quality at the boundaries of Site 22 or NS Great Lakes (i.e., at Lake Michigan).

The models used for this evaluation are analytical solutions for modeling groundwater transport of contaminants in a very simplified manner. Certain assumptions inherent in these models cause a significant amount of conservatism in the modeling results:

- The source of PCE was assumed to be constant throughout each model simulation. The model, as constructed, is overly conservative because it assumes that the concentrations of PCE at the source will remain constant and will not be depleted over time.

- The maximum concentration detected in post-treatment samples was conservatively used to represent the contaminated groundwater.

4.6 POST-TREATMENT RISK ASSESSMENT RESULTS

This section presents the cancer and noncancer risk estimates for post-treatment soil and groundwater/pore water samples at Site 22 (Table 4-4).

Quantitative risk estimates are compared to typical risk benchmarks to interpret the quantitative risks and to aid risk managers in determining the need for remediation at a site. Calculated incremental lifetime cancer risks (ILCRs) are interpreted using the U.S. EPA's "target range" ($1x10^{-4}$ to $1x10^{-6}$) and the Illinois EPA goal of $1x10^{-6}$, and noncarcinogenic hazard indices (HIs) are evaluated using a target value of 1.0.

U.S. EPA has defined the range of $1x10^{-4}$ to $1x10^{-6}$ as the ILCR target range for most hazardous waste facilities addressed under the Comprehensive Environmental Response, Compensation and Liability Act and RCRA. Individual or cumulative ILCRs greater than $1x10^{-4}$ are typically not considered as protective of human health, and ILCRs less than $1x10^{-6}$ are generally regarded as protective. Risk management decisions are necessary when the ILCR is within the 1×10^{-4} to 1×10^{-6} cancer risk range. An HI exceeding 1.0 indicates that there may be potential noncarcinogenic health risks associated with exposure.

As shown in Table 4-4, post-treatment estimated cancer risks for construction workers and future occupational workers are less than the U.S. EPA's target risk range (1×10^{-4} to 1×10^{-6}) and the Illinois EPA goal of 1×10^{-6}. Cancer risks for hypothetical future residents are within the U.S. EPA target risk range and slightly exceed the Illinois EPA goal. Post-treatment noncarcinogenic HIs are less than the U.S. EPA and Illinois EPA goal of 1.0.

For purposes of comparison, pre-treatment risks calculated in the RI/RA are presented Table 4-3. As indicated in Table 4-4, post-treatment cancer and noncarcinogenic risks are one to two orders of magnitude less than the pre-treatment risks.

TABLE 4-1

SUMMARY OF DESCRIPTIVE STATISTICS AND COMPARISONS FOR TREATABILITY STUDY
SURFACE/SUBSURFACE SOIL DATA - ROUNDS 3/4
SITE 22 - BUILDING 105 OLD DRY CLEANING FACILITY
NAVAL STATION GREAT LAKES, ILLINOIS

Parameter	Frequency of Detection	Range of Detects	Range of Nondetects	Maximum	Sample with Maximum Concentration	Average of Positive Results	Average of All Results(1)	Illinois TACO for Soil Ingestion(2)	Illinois TACO for Soil Inhalation-Residential(2)	Illinois TACO for Soil Inhalation-Industrial(2)	Illinois TACO for Soil Inhalation-Construction(2)	Illinois TACO Leachability to GW Residential(2)	Region 9 Residential Soil PRGs(3)
Volatiles (ug/kg)													
1,1-DICHLOROETHENE	1/15	1.1 J - 1.1 J	4.6 - 700	1.1	NTC22SB150001R2	1	110	700000	1500000	1500000	300000	60	120000
VINYL CHLORIDE	1/15	0.48 J - 0.48 J	4.6 - 700	0.48	NTC22SB150001R2	0.5	110	460	280	1100	1100	10	79
TRANS-1,2-DICHLOROETHENE	2/15	2.7 J - 8	4.6 - 700	8	NTC22SB150001R2	5	110	1600000	3100000	3100000	3100000	700	69000
CIS-1,2-DICHLOROETHENE	6/15	2.5 J - 250	5.4 - 470	250	NTC22SB211314R2	120	120	780000	1200000	1200000	1200000	400	43000
TRICHLOROETHENE	11/15	0.55 J - 4000	5.4 - 280	4000	NTC22SB221819R3	470	370	58000	5000	8900	12000	**60**	**2900**
TETRACHLOROETHENE	13/15	3.5 J - 19000	4.6 - 5.4	19000	GL95105S120001R2	4300	3700	**12000**	**11000**	20000	28000	**60**	**480**
Miscellaneous Parameters													
PERCENT SOLIDS	15/15	79.3 - 89.7	--	79.3 - 89.7	NTC22SB191920R2	84.6	84.6	NA	NA	NA	NA	NA	NA

Shaded chemical names indicate that the maximum chemical concentration exceeds the minimum criteria.
The original and field duplicate samples are counted as one sample in the frequency of detections.
1 - The average concentrations were calculated by using one-half the detection limit for non-detects.
2 - Illinois EPA (February 2003).
3 - U.S. EPA Region 9 PRGs (USEPA, October 2004).
J - Positive result is estimated as a result of a value less than the reporting limit or a technical noncompliance.

Associcated Samples:

GL95105S120001R2	NTC22SB10D1012R3	NTC22SB200607R2
GL95105S120203R2	NTC22SB150001R2	NTC22SB210910R2
NTC22SB05S0001R2	NTC22SB151112R3	NTC22SB211314R2
NTC22SB06D0708R2	NTC22SB191920R2	NTC22SB220708R2
NTC22SB06D0708R2-D	NTC22SB191920R2-D	NTC22SB221819R3
NTC22SB10D0708R2	NTC22SB200203R2	

TABLE 4-2

SUMMARY OF DESCRIPTIVE STATISTICS AND COMPARISONS FOR TREATABILITY STUDY
GROUNDWATER (PORE WATER) DATA
SITE 22 - BUILDING 105 OLD DRY CLEANING FACILITY
NAVAL STATION GREAT LAKES, ILLINOIS

Parameter	Frequency of Detections	Range of Detects	Range of Nondetects	Sample with Maximum Concentration	Average of Positive Results	Average of All Results(1)	Maximum	IL TACO Groundwater Ingestion Tier 1 (1)	Region 9 Tap Water(2)
Volatiles (ug/L)									
CHLOROMETHANE	1/3	0.38 J	1	NTC22MW06SR	0.38	0.46	0.38	NA	160
CIS-1,2-DICHLOROETHENE	3/3	0.21 J - 2.3	---	NTC22MW06SR	1.3	1.3	2.3	70	61
TETRACHLOROETHENE	3/3	1.2 - 16	---	NTC22MW10DR	8.8	8.8	16	**5**	**0.1**
TRICHLOROETHENE	2/3	1.2 - 5.2	1	NTC22MW06SR	3.2	2.3	5.2	**5**	**1.4**

Shaded chemical names indicate that the maximum chemical concentration exceeds the minimum criteria.
The original and field duplicate samples are counted as one sample in the frequency of detections.
1 - Illinois EPA (February 2003).
2 - USEPA Region 9 PRGs (USEPA, October 2004).
J - Positive result is estimated as a result of a value less than the reporting limit or a technical noncompliance.

Associated Samples:
NTC22MW06SR
NTC22MW10SR
NTC22MW10DR

TABLE 4-3

POST-TREATMENT PCE MODELING INPUT PARAMETERS AND RESULTS
SITE 22 - FORMER BUILDING 105 OLD DRY CLEANING FACILITY
NAVAL STATION GREAT LAKES, ILLINOIS

Source Width (ft)	Source Depth or Thickness (ft)	Soil Porosity (site-specific) (unitless)	Hydraulic Conductivity (1) (ft/day)	Hydraulic Gradient (ft/ft)	1st Order Degradation Constant for PCE ($days^{-1}$)	Concentration of PCE at Source (ug/L)	Distance from Source to Exposure Point (ft)	Concentration of PCE at Exposure Point (ug/L)
20	15	0.35	0.796	0.264 (east)	0.00096	16	75	5
20	15	0.35	0.796	0.168 (south)	0.00096	16	75	5
20	15	0.35	0.796	0.119 (west)	0.00096	16	75	5
20	15	0.35	0.796	0.264 (east)	0.00096	16	1300	0.006
20	15	0.35	0.796	0.168 (south)	0.00096	16	1300	0.003
20	15	0.35	0.796	0.119 (west)	0.00096	16	1300	0.001

1. Arithmetic mean conductivity for shallow groundwater.

TABLE 4-4

SUMMARY OF HUMAN HEALTH RISKS
SITE 22 - FORMER BUILDING 105 OLD DRY CLEANING FACILITY
NAVAL STATION GREAT LAKES, ILLINOIS

Receptor	PRE-TREATMENT CANCER RISKS			POST TREATMENT CANCER RISKS		
	Surface Soil	Subsurface Soil	Groundwater/ Pore Water	Surface Soil	Subsurface Soil	Groundwater/ Pore Water
Construction Worker	2x10-5	4x10-6	6x10-5	2x10-7	1x10-7	2x10-8
Occupational Worker	3x10-5	1x10-5	2x10-6	1x10-6	9x10-7	1x10-7
Future Child Resident	1x10-4	3x10-5	3x10-5	2x10-6	1x10-6	1x10-7
Future Adult Resident	1x10-4	3x10-5	5x10-5	2x10-6	1x10-6	2x10-7
Future Resident (Child + Adult)	2x10-4	6x10-5	8x10-5	3x10-6	2x10-6	3x10-7

Receptor	PRE-TREATMENT NONCANCER RISKS			POST TREATMENT NONCANCER RISKS		
	Surface Soil	Subsurface Soil	Groundwater/ Pore Water	Surface Soil	Subsurface Soil	Groundwater/ Pore Water
Construction Worker	26	4	8	0.4	0.6	0.06
Occupational Worker	0.2	0.06	0.02	0.01	0.01	0.003
Future Child Resident	3	1	1	0.06	0.06	0.01
Future Adult Resident	1	0.2	0.5	0.01	0.02	0.004
Future Resident (Child + Adult)	NA	NA	NA	NA	NA	NA

NA - Not applicable.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 SUMMARY AND CONCLUSIONS

The following is a summary of the results of the ERH treatability study and the conclusions drawn:

- The ERH technology was successfully designed, installed, operated, and removed with no detrimental impact to NS Great Lakes facility operations.

- Electricity was transferred to the subsurface via 16 electrodes installed at the site. The subsurface temperature was measured by three sets of subsurface TMPs. Vapors were recovered from the subsurface, and cVOC concentrations of the vapor stream were measured in the field and laboratory.

- The maximum subsurface temperature achieved was 109 degrees Celsius, and subsurface temperatures throughout the ERH treatment volume exceeded 90 degrees Celsius and were maintained, providing evidence that boiling conditions were achieved at depth across the treatment volume and exceeding the project goal.

- Based on vapor stream sample concentrations obtained during the ERH treatability study, the greatest mass of cVOCs was extracted during the period when the average temperature of the treatment area was between 76 and 86 degrees Celsius.

- An estimated 1,200 pounds of cVOCs were removed from the treatment area through the vapor recovery system, meeting the project goals.

- Data from a baseline sampling event and four interim soil sampling events were evaluated to determine the performance of the demonstration. Fifteen soil samples were collected from nine locations and several depths within the treatment area.

- The average cVOC concentration in the soil within the treatment area was reduced by 99 percent from a pre-remediation concentration of 445 mg/kg to 4 mg/kg. This exceeded the project goal of 95.5-percent reduction.

- Pore water concentrations in the monitoring well located in the treatment area were reduced by 99 percent, meeting the project goals.

- Utilizing post-remediation sample concentrations, an HHRA was conducted. The noncancer risks were less than the Illinois EPA goal of 1. The maximum cancer risk is 3×10^{-6}, within the U.S. EPA target risk range and only slightly greater than the Illinois EPA goal. Cancer risks for all receptors were reduced by one to two orders of magnitude.

- The exclusion of the Groundwater Ingestion Exposure Route, as provided in Subpart C of TACO, Part 742.320, applies at this site.

5.2 RECOMMENDATIONS

Based on the significant mass removal, concentration reductions, and risk reductions achieved, no additional active remediation is recommended for this site. However, because of residual cVOC concentrations, LUCs should be put in place to limit exposure to groundwater and soil at the site. These LUCs will be detailed in the LUC Remedial Design document to be submitted following approval of the Proposed Plan and Record of Decision (ROD) for the site, and in general will include the following:

- Maintaining the prohibition on use of groundwater that is in force throughout NS Great Lakes as detailed in the LUC Memorandum of Agreement (Naval Station Great Lakes, 2003). Site 22 will be formally added to the Navy and Illinois EPA LUC Memorandum of Agreement.

- Requiring that the NS Great Lakes Environmental Department be notified prior to intrusive work being conducted at or near the site. A site safety plan to address possible worker exposure to the soil and shallow groundwater will be developed and implemented to address the intrusive work.

- Maintaining the existing cap system (high-density polyethylene and asphalt parking lot) and inspecting the area on an annual basis.

- Restricting the property use to industrial and commercial purposes.

- Requiring that soil removed from this area during future activities is managed in accordance with 35 Illinois Administrative Code, Subtitle G: Waste Disposal.

Based on the results of this treatability study and the recommendations above, corrective actions at this site have been completed and RCRA interim status closure is appropriate for the RCRA hazardous waste management unit associated with Site 22 and NS Great Lakes. Therefore, the following completed forms are included with this document (Appendix I):

- *Illinois EPA RCRA Corrective Action Certification*. This form certifies that the corrective action was completed in accordance with the requirements of the NS Great Lakes RCRA permit. This is certified by the owner/operator (NS Great Lakes), the licensed professional overseeing the activities (Robert Davis, PE, of TtNUS), and the analytical laboratory (Severn Trent Laboratories, Inc.).

- *RCRA Interim Status Closure Certification Form*. This form certifies that the hazardous waste management unit has been closed in accordance with a plan approved by Illinois EPA and must be attached to the report that demonstrates closure. This is certified by the owner/operator and the licensed professional overseeing the activities.

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APPENDIX A

FINAL ERH REPORT – TRS, 2006

Final Report
Electrical Resistance Heating

Naval Station Great Lakes
Great Lakes, Illinois

Date Issued—December 4, 2006

Prepared By
Thermal Remediation Services, Inc.
2325 Hudson Street
Longview, Washington 98362

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LIST OF ACRONYMS AND ABBREVIATIONS

Term	Definition
bgs	below grade surface
^{o}C	degrees Celsius
CVOC	chlorinated volatile organic compound
dB	decibel
ERH	electrical resistance heating
GAC	granular activated carbon
kW	kilowatt
kW-hr	kilowatt hour
lbs	pounds
lbs/hr	pounds per hour
µg/l	micrograms per liter
mg/kg	milligram per kilogram
PCE	tetrachloroethene
PCU	power control unit
PID	photo ionization detector
ppm	parts per million
SCFM	standard feet per minute
TCE	trichloroethylene
TRS	Thermal Remediation Services, Inc.
TTNUS	Tetra Tech NUS
TMPs	temperature monitoring points
VR	vapor recovery

EXECUTIVE SUMMARY

This report presents the results of the Electrical Resistance Heating (ERH) project performed at the Naval Station Great Lakes in Great Lakes, Illinois. Based upon soil sampling over the life of the study, the ERH system successfully accomplished the project goal by reducing tetrachloroethene (PCE) concentrations in soil by an average of 99 percent.

Thermal Remediation Services, Inc. (TRS) has prepared this report on behalf of the Department of the Navy, Southern Division Naval Facilities Engineering Command under subcontract to Tetra Tech NUS (TTNUS). The information presented in this report is based on data collected from various media before and during ERH operations.

The ERH project was conducted by the Navy to remediate source area contaminants from a former dry cleaning facility. The goal of the project was to reduce baseline concentrations of PCE in soil to less than 20 milligrams per kilogram (mg/kg). It was calculated that doing so would remove 96% of the estimated PCE mass from source area soil.

Because previous investigations had identified contamination at variable depths, the ERH treatment volume was shaped as an elongated wedge. To effectively treat the most impacted portions of the source area, the electrodes were designed to heat portions of the site from as shallow as 1 foot below grade surface (bgs) to as deep as 26 feet bgs. The final treatment area and treatment volume measured 2,400 square feet and 1,400 cubic yards, respectively.

The ERH system incorporated 16 electrodes, each with a co-located vapor recovery (VR) well. Subsurface temperatures were measured using 14 thermocouples placed at set depth intervals within three temperature monitoring points (TMP).

Recovered steam and soil vapors were condensed in the ERH condenser before releasing the VOCs to the atmosphere. Condensed steam was either evaporated in the systems cooling tower, or returned to the subsurface at the electrodes. Vapor phase granular activated carbon (GAC) vessels were onsite to treat the vapor stream if the chlorinated volatile organic compounds (CVOC) emission rate exceeded 8 pounds per hour.

ERH operations lasted 134 days and a total of 632,866 kilowatt hours (kW-hrs) of energy were applied to the subsurface. The maximum subsurface temperature achieved was 109 degrees Celsius (ºC), while the maximum average temperature within the treatment volume was 90.0 ºC.

Based upon vapor sampling collected weekly or biweekly after the peak extraction, an estimated 1,200 pounds of total chlorinated volatile organic compounds (CVOCs) were removed by volatilization during the ERH Project. Samples obtained from fifteen separate locations indicated that the average concentration of PCE in treatment area soil had been reduced to 4.09 mg/kg, a 99% reduction from the average baseline value of 445.32 mg/kg.

1.0 Introduction

This report presents the results of the ERH project conducted at the Naval Station Great Lakes located in Great Lakes, Illinois. ERH was applied to decrease the average PCE concentration in soil within the treatment volume to less than 20 mg/kg. This document was prepared by TRS for TTNUS under Subcontract No.1007413 and the Department of the Navy, Southern Division Naval Facilities Engineering Command under Contract Number N62467-04-D-0055/ CTO0009.

2.0 ERH Performance Goals and Design Specifications

The Naval Station Great Lakes ERH project was a guaranteed cleanup with TRS operating until the goal was achieved with no change in cost. The primary performance goal of the project was to reduce the average concentration of PCE in soil within the treatment volume from 445 mg/kg to 20 mg/kg. Achieving this reduction in average PCE concentrations would effectively reduce contaminant mass in the source area by 96%.

The amount of energy needed to be input to the source area during the ERH remediation to achieve a 96% reduction in contaminant mass was originally estimated to be 325,000 kW-hr. It was also estimated that 8 weeks of ERH operations would be required to input the energy necessary for a successful cleanup. The actual amount of energy applied was 632,866 kW-hrs over 19 weeks of operations. A copy of the treatment area plot plan, electrode design, trenched electrode design and process flow have been attached as Figures 1-4.

The treatment volume was shaped like a long wedge measuring 2,400 square feet in surface area with a total volume of 1,400 cubic yards. The ERH system used 16 electrodes with the primary heating zone extending from 1 foot bgs to depths ranging from 9 to 26 feet bgs, depending on location.

3.0 System Construction

Construction of the ERH system began on April 17, 2006 with the placement of the surface equipment, including the Power Control Unit (PCU), steam condenser, cooling tower, 6,000 gallon holding tank and 40 horsepower vapor recovery blower package. Marking of the subsurface utilities, confirmatory soil sample locations and electrode locations was also performed.

To monitor subsurface temperatures, three TMPs were installed within the treatment area. Within each TMP, individual thermocouples were spaced every five feet through the zone of heating to automatically record subsurface temperatures in the treatment volume and allow for the creation of subsurface heating profiles.

A total of 16 electrodes with co-located VR wells were installed across the source area. A copy of the treatment area plot plan has been attached as Figure 1

Drilling started on April 24 and was completed on May 1, 2006. TTL, Inc. used a hollow stem auger rig to advance the boreholes for each co-located electrode/VR well to their design depths. Due to buried utilities oriented along Sampson Street, the two electrodes in the "H" row were moved two feet into Sampson Street and were finished below grade. These electrodes were completed 18 inches below grade to isolate them from the vehicle and pedestrian traffic on Sampson Street. The other electrodes were completed above grade in accordance with the original system design. A copy of the electrode design and trenched electrode design are attached as Figures 2 and 3.

Four electrodes and one TMP were installed to a total depth of 9 feet bgs on the western side of the site, designated as Area 3. Temperature monitoring depths in Area 3 were established at 1, 5 and 8 feet bgs. The central portion of the site was designated as Area 2 and a total of nine electrodes and one TMP were installed to 18 feet bgs. Temperature monitoring depths were set at 1, 5, 10, 15, and 18 feet bgs. Treatment in the eastern side of the site, Area 1, extended the deepest with three electrodes and one TMP installed to 26 feet bgs. Thermocouples in the Area 3 TMP were placed at 1, 5, 10, 15, 20, and 25 feet bgs. A design change was made to the electrodes in the "G" row resulting in the conductive interval of each electrode being lowered to 6 feet bgs due to the existence of an abandoned steam chase.

Surface construction, including VR piping and electrical supply cabling to the electrodes/VR wells, was completed during the week following drilling. TRS installed vapor phase GAC vessels for the potential treatment of extracted CVOCs on May 8, 2006. The system was fully constructed and ready for operational testing on May 8, 2006. A copy of the system process flow diagram has been attached as Figure 4.

The primary electrical service was delivered to the system from a high voltage switch located 200 feet west of the site along Porter Avenue. A horizontal boring was installed to carry the 13,200 volt service to a 500 kW step down transformer located inside the equipment compound. A service disconnect switch and meter were installed on transformer before final inspection by Great Lakes facility management. The installation was approved for operation and energized on May 22, 2006.

4.0 System Startup

System startup and shakedown began on May 22-23, 2006. Once the electrical and VR connections were complete, power was applied to the VR blower and steam condenser so that they could be tested. After proper operation of the internal and external interlocks for each system component was verified, TRS applied power to the electrodes so that startup step and touch voltage safety testing could be performed. Interlocks are connected between each unit of equipment to ensure the electrodes are de-energized in there is a lose of vapor recovery or an internal malfunction. No voltage potentials greater than the 15-volt limit established by TRS were found at the site.

With the initial voltage safety survey complete, the applied voltage to the subsurface was slowly increased throughout the remainder of the day. With each voltage increase, checks for surface voltage were performed and results recorded. In no instance did readings exceed the TRS 15-volt limit.

The ERH system was left offline overnight and additional performance and safety testing was conducted the following day. The ERH system was deemed fully operational on May 24, 2006 and the project status moved from the Startup phase to the Operations phase.

During ERH startup and early operations, step and touch voltage potentials in and around the electrode field were monitored frequently to make sure public and worker safety from electrical hazards. When the applied voltage to the subsurface was raised to 240 volts, TRS obtained step and touch voltage readings on the perimeter fence in the vicinity of electrodes H3 and H4 that were nearing the TRS established 15-volt limit.

To address this concern, TRS replaced a portion of the metal fence along Sampson Street with a wooden panel fence that extended 15 feet north and south of electrode row “H”. As an additional precaution, the concrete and asphalt extending three feet on either side of the wooden fence was painted with an isolating dielectric paint. The wooden fence eliminated potential voltage hazards from ground to the fence and the paint insulated the surface from the pavement underneath. To monitor surface voltages over time, step and touch readings in and around the entire electrode field were collected during every TRS site visit. These efforts were taken to make sure on-going site safety.

5.0 Noise Abatement

To make sure that the system met the noise abatement criteria of 60 decibels (dB) at the perimeter fence, custom noise abatement mufflers were installed on each of the system’s cooling fans and blowers. Noise testing conducted upon system startup verified that the 60 dB noise restriction had been met.

6.0 Soil Sampling

Soil sampling was conducted during the ERH system operations to measure the amount of contamination remaining in the treatment area and to guide operational changes intended to optimize remediation efforts towards the most impacted portions of the site. The results of each sampling event are presented in Table 1. The same data is shown graphically in Figure 5.

The first round of interim soil sampling was conducted on July 11, 2006. The electrode field was reconfigured on July 20, 2006 after sampling results indicated that the site cleanup criteria had been achieved in the western portion of the treatment area. TRS removed four electrodes from service in order to reduce the amount of energy being applied to areas that had achieved the cleanup goal.

The PCE concentration goal of 20 mg/kg had not been met at eight of the fifteen sampling locations and the reduction in treatment area size was intended to target the areas that required further remediation. One such location was the area surrounding SB-19, where concentrations of total CVOCs in soil measuring 3,305 mg/kg were recorded during the July 11, 2006 interim sampling event. This value was more than twice the highest total CVOC concentration previously reported at the site.

The second round of interim soil sampling was conducted on August 8, 2006. Only the five sampling locations that greatly exceeded the cleanup goal during the July 11, 2006 sampling event were re-sampled. Analytical results indicated that only one of these five sample locations remained above the cleanup criteria and the treatment area was reconfigured a second time to target that one location.

On August 3, 2006, TRS determined that the connection between the PCU and electrode H3 had been lost and that the fault was within the four foot section of utility trenching extending from the site under Sampson Street to the electrode. Once the soil analytical results from the second round of interim soil sampling indicated that the area surrounding electrode H3 was still impacted above the remedial goal, the electrode was repaired on August 15, 2006 and placed back in service.

A third round of interim sampling was conducted on September 12, 2006. The third interim sample event retested the 15 sampling locations, with the results indicating a decrease at location SB-19 from 1,033 mg/kg to 0.005 mg/kg. However, three locations showed an increase from previously low concentrations. The electrode array was again reconfigured to target the three sample locations that remained above the guaranteed cleanup goal.

A fourth and final round of sampling completed on September 28, 2006 indicated that the reductions in PCE concentration needed to meet the project cleanup goals had been achieved at every sample location.

Table 1. Summary of Soil Sampling Results, PCE (mg/kg)

Sample ID	Depth (feet bgs)	Baseline (mg/kg)	Interim 7/11/06 (mg/kg)	Interim 8/8/06 (mg/kg)	Interim 9/12/06 (mg/kg)	Final 9/28/06 (mg/kg)	Percent Reduction
SB-20	6-7	26	11	NS	3.3	NS	86.9%
SB-21	9-10	16	57.7	0.92	0.4	NS	97.5%
SB-21	13-14	183	221	0.78	1.3	NS	99.3%
SB-22	7-8	19	0.002	NS	0	NS	100%
SB-22	18-19	200	0.79	NS	62.4	15.0	92.5%
105S-13	2.5- 3	1,500	58.1	0.01	1.1	NS	99.9%
MW-05S	0-1	190	4.5	NS	0.6	NS	99.6%
105S-12	0-0.5	370	20.9	NS	19.3	NS	94.8%
10-105S-12	2.5-3	600	21.2	NS	3.2	NS	99.4%
SB-19	19-20	584.9	3,305.7	1,033	0	NS	100%
SBGP-04	8-12	550.8	36.1	NS	0	NS	100%
MW-10D	9-11	133	0.35	NS	192.2	15.3	88.4%
SB-15	0-1	829.7	3.1	NS	0.2	NS	99.9%
SB-15	11-12	590	255.3	15.8	94.1	1.0	99.8%

MW-06D	7-8	886.4	2.5	NS	0.2	NS	99.9%
Average		**445.3**	**266.5**	**76.6**	**25.2**	**4.09**	**99.08%**

Notes:

NS-Not Sampled

The final average percent reduction was calculated by using the lowest concentration from the 9/12/06 and 9/28/06 sample events

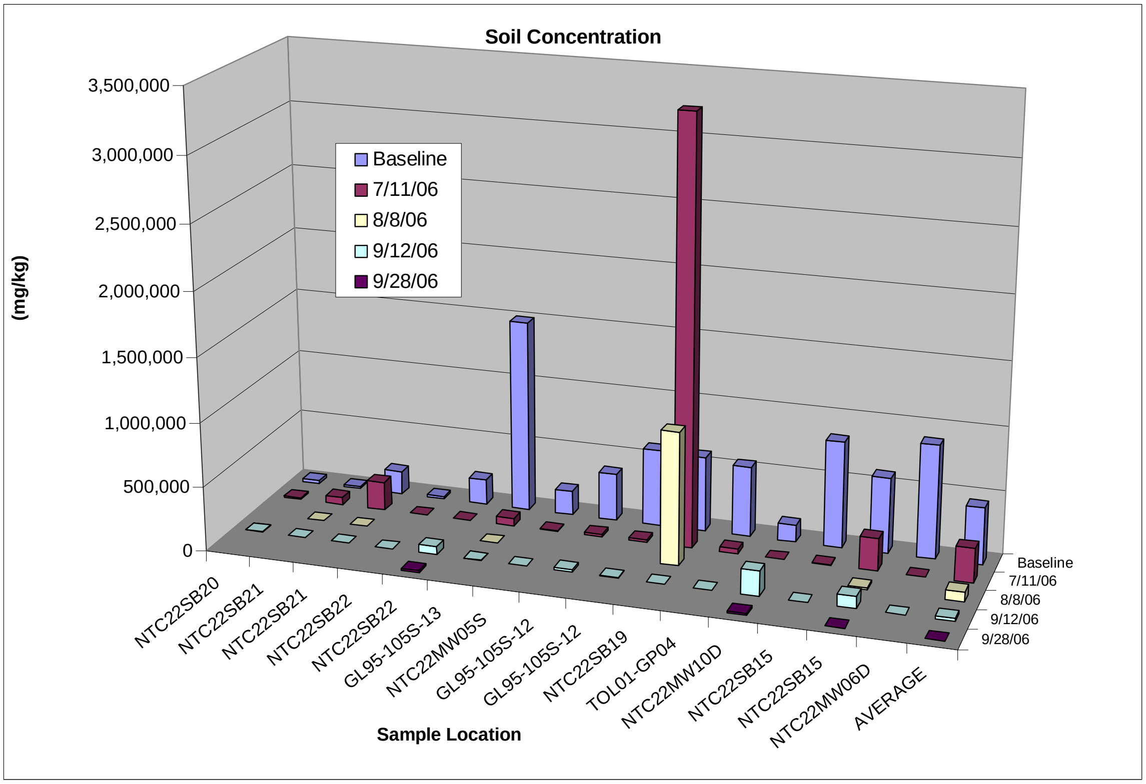

Figure 5. Contaminant Concentrations with Time

The first round of interim soil sampling re-sampled the 15 baseline sampling locations once the ERH system had input the amount of energy initially estimated to be sufficient to achieve the cleanup criteria. The concentrations of PCE in soil at seven of the 15 sampling locations were reduced to below the cleanup guarantee of 20 mg/kg. The average PCE concentrations from the sampling locations indicated a 41% reduction to 266.5 mg/kg from a baseline value of 445.3 mg/kg.

The second interim sampling event was scheduled because the concentrations of PCE in the recovered vapor stream had decreased from a maximum of 1,290 micrograms per liter (µg/l) to less than 400 µg/l. During the second soil sample event, the five locations that greatly exceeded the guaranteed cleanup criteria during the initial interim sampling event were re-sampled. The concentrations of PCE in soil at three of the five sampling locations were reduced to less than 1 mg/kg, with another reduced to 15.8 mg/kg. PCE concentrations in soil at the fifth sampling location (SB-19 at 19-20 feet) decreased by 69% but remained above the cleanup guarantee. The result of the second interim sampling event was an average site PCE in soil concentration of 76.6 mg/kg.

The third interim sampling event was performed once a 95% reduction in the peak vapor stream concentrations of PCE had been achieved. PCE concentrations at the one sampling location still exceeding cleanup criteria during the previous sampling event, SB-19 at 19-20 feet, decreased to less than 0.005 mg/kg. However, three sampling locations where PCE concentrations had previously been measured below the cleanup guarantee had increased enough to hold the site average PCE concentration in soil at 25.2 mg/kg.

The fourth, and final, sampling event showed that PCE concentrations at the three remaining sampling locations had decreased to less than 15.3 mg/kg and lowered the site average PCE concentration in soil to 4.09 mg/kg, which represented a reduction of 99% from baseline. That reduction met the projects goal of industrial land use criteria less than 20 mg/kg of PCE.

7.0 Water Balance

Operation of the ERH system produced a negative gradient on the groundwater table surrounding the treatment volume as the system extracted more water than was reintroduced as electrode re-wetting drip. The total volume of water entrained from the subsurface or removed from the treatment area as condensate was 195,368 gallons, while the ERH system returned only 179,140 gallons of water to the vadose zone to maintain proper moisture content in the subsurface for efficient ERH application.

Water removed from the treatment volume was treated by the condenser cooling tower. The cooling tower acts like an air stripper and recovered water makes hundreds of passes before being returned to the subsurface. Surplus water, combined with the potable makeup water initially added to the system at startup, was evaporated from the cooling tower during the operations period. Laboratory results from a sample of the cooling tower water collected on May 30, 2006 (approximately 1 week after startup) showed no CVOCs were detected in the cooling tower water. The laboratory results are provided in Attachment B.

8.0 System Operations and Shutdown

The ERH system operated for 134 days with power being applied on 125 of those days. Power input was stopped for a combined total of 6 days to allow for the four soil sampling events and an additional 3 days for general system maintenance and repair.

At the instruction of the Navy and TTNUS, power application to the field was stopped on October 4, 2006, following receipt of analytical data indicating that the guaranteed remedial goal for the project had been met. The vapor recovery blower and steam condenser remained operational until October 16, 2006 to make sure that additional contaminant vapors that may have been present in the subsurface were collected.

9.0 Vapor Stream Analyses

TRS collected CVOC vapor stream samples weekly during the first 7 weeks of the ERH operating period using Tedlar bags. These samples were then delivered to an off site laboratory for analyses and the laboratory reports are provided in Attachment A. The sampling frequency decreased to bi-monthly after the peak contaminant extraction rate had passed. The analytical results from these sampling events are summarized in Table 2. Based on the vapor data collected in the off-gas stream, TRS estimates that approximately 1,200 pounds of contaminants were removed by volatilization during the ERH application.

The vapor stream flow rate was measured daily by the PCU automated software and multiplied by the CVOC concentration for each sample date to calculate mass removal rates. Tracking of the total mass removed in the vapor stream began on May 24, 2006 using the assumption that the initial concentration of CVOCs in the vapor steam was zero. The mass removed between two subsequent sampling periods was calculated by averaging the rate of extraction between the two consecutive sampling events.

Table 2. Vapor Stream Concentration Results

Sampling Date	PCE (µg/L)	TCE (µg/L)	PID (ppm)	CVOC Removal Rate (lbs/hr)	CVOCs Removed during period (lbs)	Flow rate (scfm)	Average Subsurface Temperature (°C)	Hours between sample events
5/25/05	84.9	ND	12	0.07	0.9	210	17	27
5/31/06	1,060	ND	319	0.83	63.7	210	31	142
6/7/06	854	ND	198	0.72	133.6	225	53	172
6/13/06	780	ND	260	0.58	93.0	198	65	143
6/21/06	1,140	ND	383	0.88	138.8	205	76	191
6/27/06	1,290	ND	596	1.26	152.4	261	81	143
7/5/06	1,050	ND	400	0.82	203.6	209	86	196
7/18/06	460	11.2	146	0.36	183.8	205	86	311
8/1/06	399	ND	68.5	0.31	112.5	210	89	333
8/16/06	40	ND	35	0.03	63.0	205	88	366
8/30/06	67.1	3.62	26.7	0.05	13.6	193	80	331
9/7/06			19.8	0.04	8.7	191	77	192
9/21/06			23	0.04	13.4	230	84	336
10/4/06			21	0.04	12.5	202	93	312
10/16/06			4	0.01	7.2	205	71	288
				Total	**1,200.4**			

Notes:

TCE = trichloroethylene

PID = photo ionization detector

ppm = parts per million

lbs/hr = pounds per hour

lbs = pounds

SCFM = standard cubic feet per minute

TRS installed vapor phase GAC units to be used as a vapor treatment system if the rate of contaminant extraction from the subsurface exceeded 8 pounds of CVOCs per hour. Based on the results of vapor sampling, the GAC vessels were left off-line throughout the entire ERH application.

Weekly sampling included field measurements with a photo ionization detector (PID) and the collection of samples in Tedlar bags for laboratory analyses. These sampling events were used to make sure compliance with vapor release permits and to calculate CVOC mass removal rates and the cumulative CVOC mass removed during ERH operations. The weekly vapor stream sample results were a key indicator of changing subsurface conditions and helped to determine what, if any, adjustments needed to be made to the ERH system operating conditions.

On July 5, 2006, the laboratory CVOC concentrations and PID results showed a decrease indicating the peak vapor contaminant extraction rate had passed. PID readings continued to be collected on a weekly basis to verify the peak vapor rate had passed and biweekly laboratory analysis of the vapor stream was conducted. The PID results consistently mirrored laboratory results and gave sufficient indication as to whether the air emission limit was being approached. Had the PID vapor stream concentration increased significantly, the collection of samples for laboratory analysis would have been reinstated.

Figure 6 illustrates the concentration of PCE in the vapor stream, in µg/l, as determined by the laboratory samples over time. This data is compared to PID reading taken from the same stream at the same time. The average subsurface temperature at the time of sampling has been included for reference.

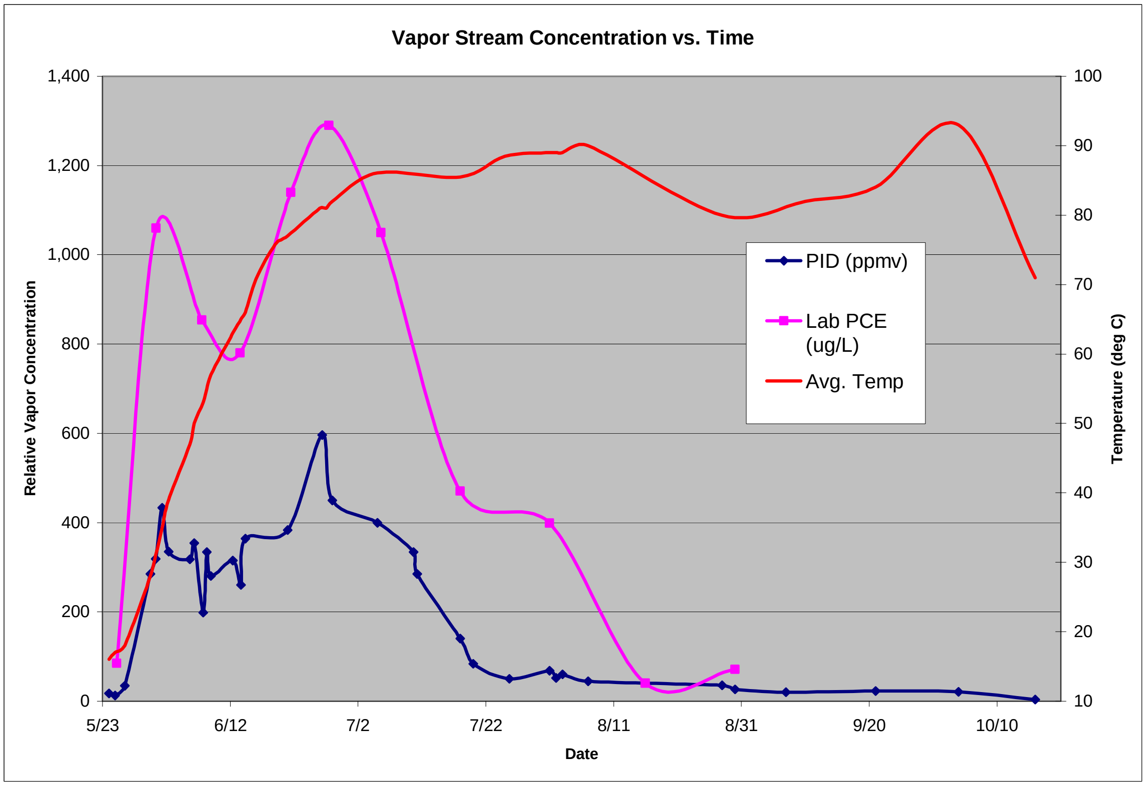

Figure 6. Vapor Concentrations and Temperature versus Time

10.0 Subsurface Temperatures

The subsurface temperature of the treatment area was measured using 14 thermocouples distributed among three TMPs. The PCU system control program was utilized to automatically read each thermocouple daily. The number of thermocouples per TMP corresponds to the depth of active heating where a specific TMP was located. At each TMP, thermocouples were separated by 5-foot depth intervals except for the 1-foot and 8-foot intervals.

The ¾-inch CPVC TMP casings were installed at the same time as the electrodes using hollow stem auger. The locations of the TMPs were selected to be spaced the furthest distance possible from the surrounding electrodes so as to monitor the coolest portions of the treatment area (Figure 1).

Prior to ERH application, the average subsurface temperature was 15.5°C. During ERH operations, subsurface temperatures in the treatment volume increased to an average of 90°C. The top and bottom of the treatment area typically appear cooler than the center primarily due to heat loss to the surrounding media. Additionally, airflow enhances evaporation within the shallow region of the site which, when combined with the applied vacuum, results in reduced boiling temperatures. When the top and bottom interval values are removed from the calculation of average temperatures, the subsurface temperature profile indicates that a maximum average temperature of 100°C was achieved throughout most of the treatment volume.

The average heat-up rate naturally decreases as individual thermocouple locations reach their respective boiling temperature at depth. From May 26 through June 18, 2006, the average subsurface temperature increased from just above ambient (18°C) to 76°C. The 58°C increase over the 24 day period equals an average heat-up rate of 2.5°C/day. A maximum heat-up rate of 3.8°C/day was achieved from June 1 through June 3, 2006.

The average subsurface heat-up rate slowed significantly after June 19, 2006, ranging from 1.0°C/day to zero, as many of the subsurface locations achieved boiling temperatures. The temperature performance of each thermocouple within each TMP varies greatly as the dynamics of energy input versus heat loss combine with the heterogeneity of the subsurface to make each temperature monitoring location perform in a unique manner. The maximum temperature achieved at each individual thermocouple is listed in Table 3.

Table 3. Maximum Temperatures Achieved (°C)

Depth (ft bgs)	Area 1	Area 2	Area 3
1	100	61	82
5	103	100	100
10	105	102	96
15	109	103	
20	103	99	
25	81		

Figure 7 depicts the average temperatures at each TMP location over time from the initial baseline readings collected on May 23, 2006 through the last day of ERH operations on October 4, 2006. Rapid reductions in temperature are seen in those portions of the site (Area 2 and 3) that were removed from service and where active ERH application stopped. A rapid return to boiling conditions is also seen in Area 2 that were returned to service after increased concentrations were noted in the results from subsequent soil sampling events.

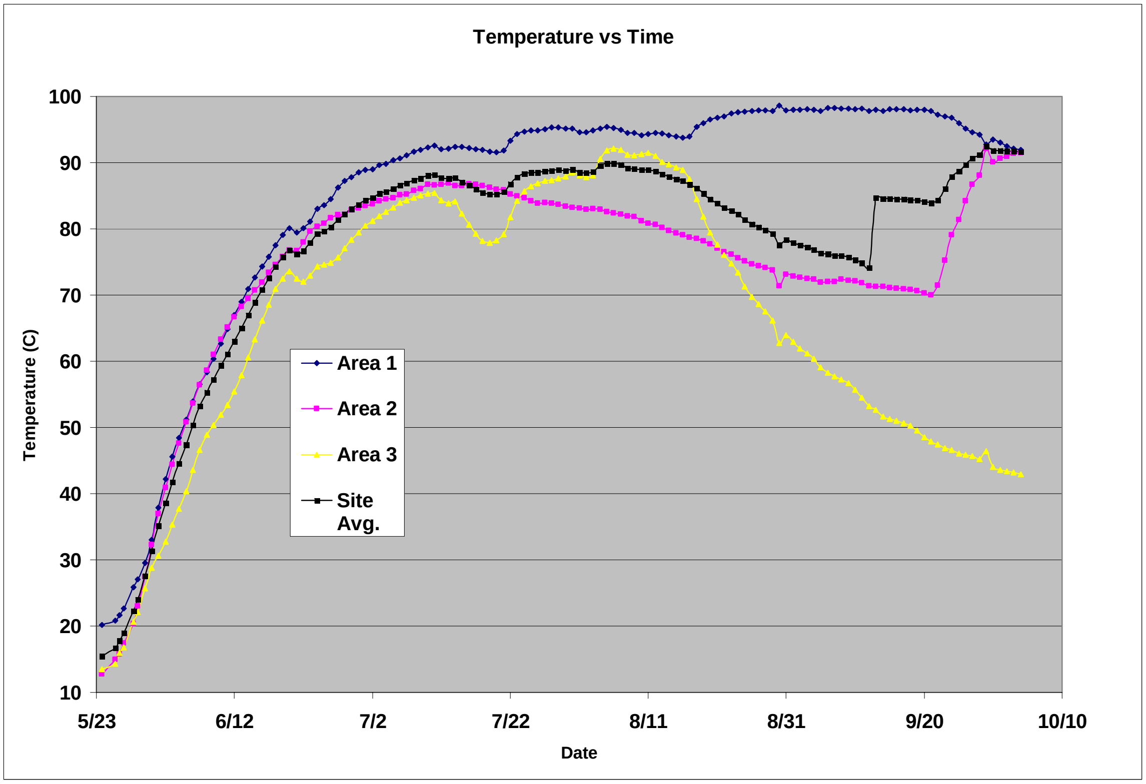

Figure 7. Average Subsurface Temperature versus Time

11.0 Power and Energy

From the start of power application to the treatment volume on May 23, 2006, a total of 632,866 kW-hrs of energy was applied to the subsurface. The energy required to remove the contamination was approximately twice the estimated amount of 328,000 kW-hr. This is due primarily to extending the operating time to target areas requiring treatment.

The average rate of power application over the entire project was 196 kilowatts (kW), with an application range of 130 kW to 318 kW over the course of the remediation. During the primary heat-up stage of operations, the system applied power at a rate of 250 to 318 kW in an attempt to get the best temperature increase versus time. After the treatment area average temperature reached 80°C, the applied power naturally decreased to a range of 180 to 220 kW as the reduction in soil moisture reduced electrical conductivity. Several changes were also made to the number of electrodes on service in an attempt to treat the area more efficiently and reduce energy consumption.

Figure 8 represents the average weekly power application over the life of the ERH application.

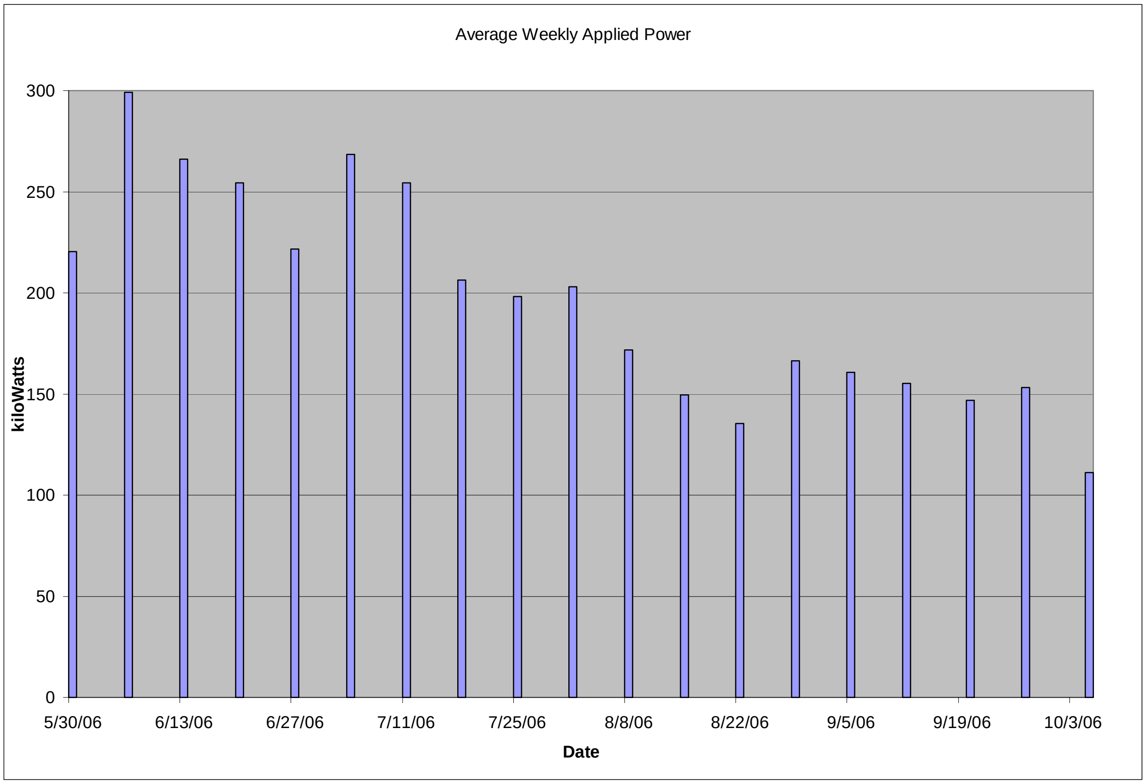

Figure 8. Average Weekly Power Input

12.0 System Demobilization

The electrodes were de-energized on Wednesday, October 4, 2006 and the electrical output from the PCU was locked out of service. The vapor recovery system continued operating until October 16, 2006, when it was shut down.

TRS personnel were on-site the week of October 16, 2006 for system demobilization, including decommissioning of the ERH equipment, electrode abandonment, and surface component decontamination and disposal. The PCU, steam condenser, and vapor recovery blower package were transferred offsite on October 19, 2006. The GAC and excess water holding tank had previously been taken offsite on August 18, 2006 as they were not needed to continue ongoing operations.

The piping from the vapor recovery system and electrode well heads were decontaminated using a steam powered pressure washer and these materials along with drip system piping were placed in a roll off for disposal as construction/demolition debris. The roll off box was inspected by Naval Station Great Lakes personnel and removed by Waste Management for transportation to the Countryside Landfill for disposal.

The remaining site restoration began four weeks later on November 6, 2006 with the removal of the electrical service transformer, site perimeter fence and the restoration of asphalt, concrete and grass surfaces. The area was cleared of debris and left in the same condition as before the remediation on November 16, 2006.

13.0 Conclusions

Based upon the data collected before and during the Naval Station Great Lakes ERH project, the following conclusions can be reached concerning this project:

1. Based upon results from fifteen sampling locations, the average concentration of PCE in soil was reduced by 99% from a pre-remediation concentration of 445.32 mg/kg to 4.09 mg/kg, exceeding the project goal of a 95.5% reduction.

2. The ERH technology was installed, operated, and removed with no detrimental impact to the local residents or Naval Station Great Lakes facility operations.

3. The maximum subsurface temperature achieved was 109°C, while the average subsurface temperature within the ERH treatment volume was 90°C, providing evidence that boiling conditions were achieved at depth across the treatment volume.

4. An estimated total of 1,200 pounds of CVOC was removed from the treatment area through the vapor recovery system.

5. Based on vapor stream sample concentrations obtained during the remediation, the greatest mass of CVOCs was extracted during the period when the average temperature of the treatment area was between 76°C and 86°C.

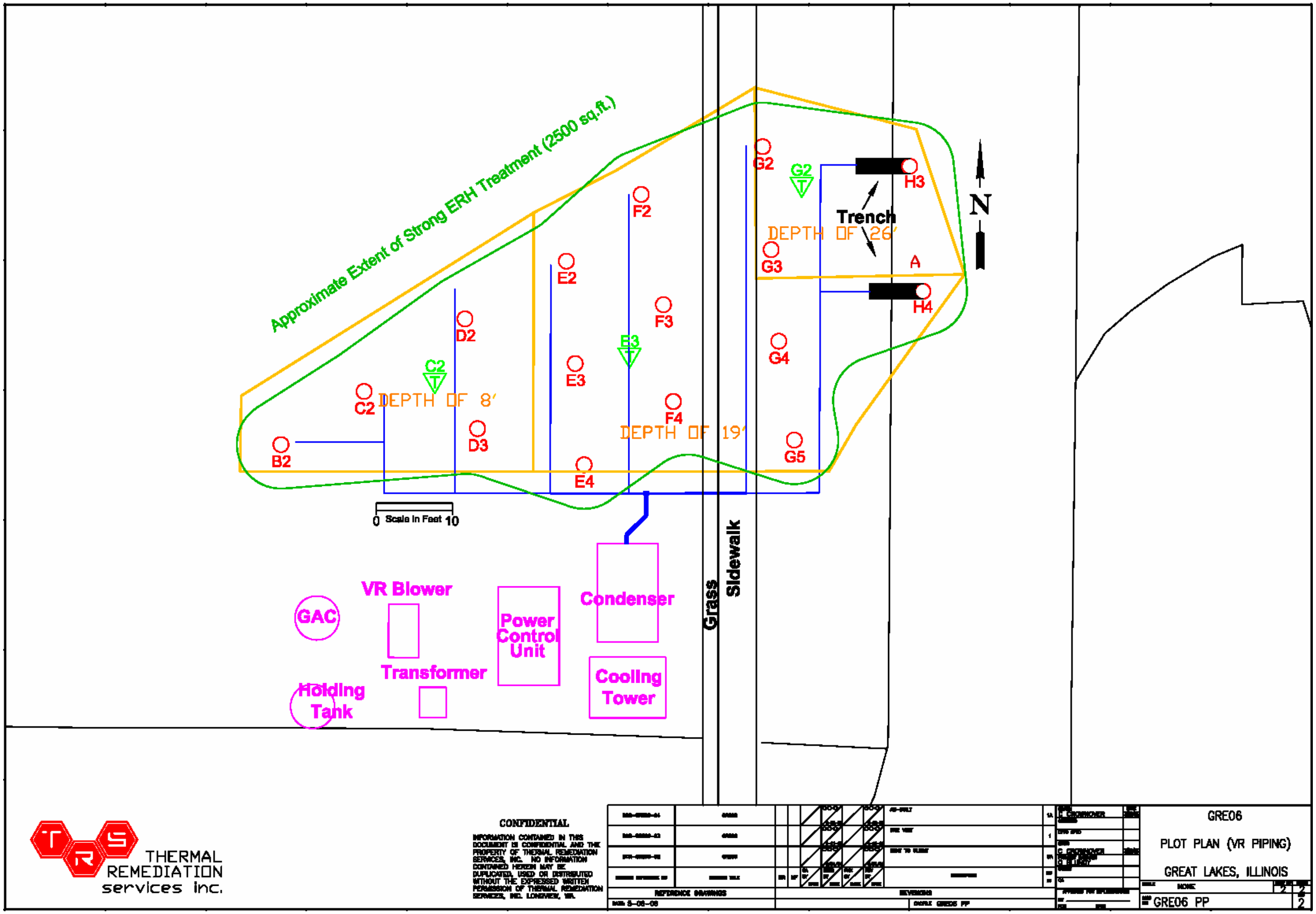

Figure 1. Treatment Area Plot Plan

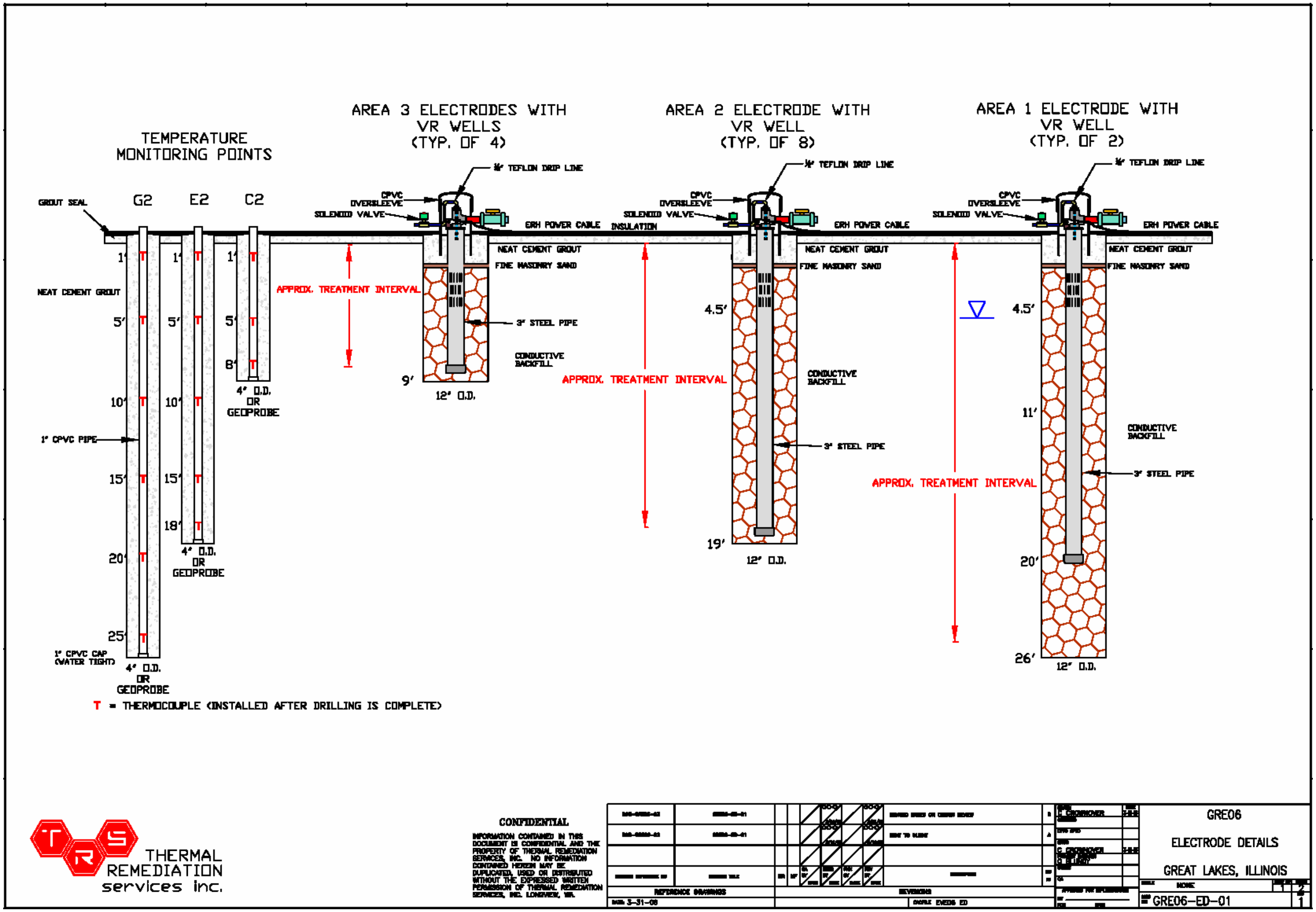

Figure 2. Electrode Design

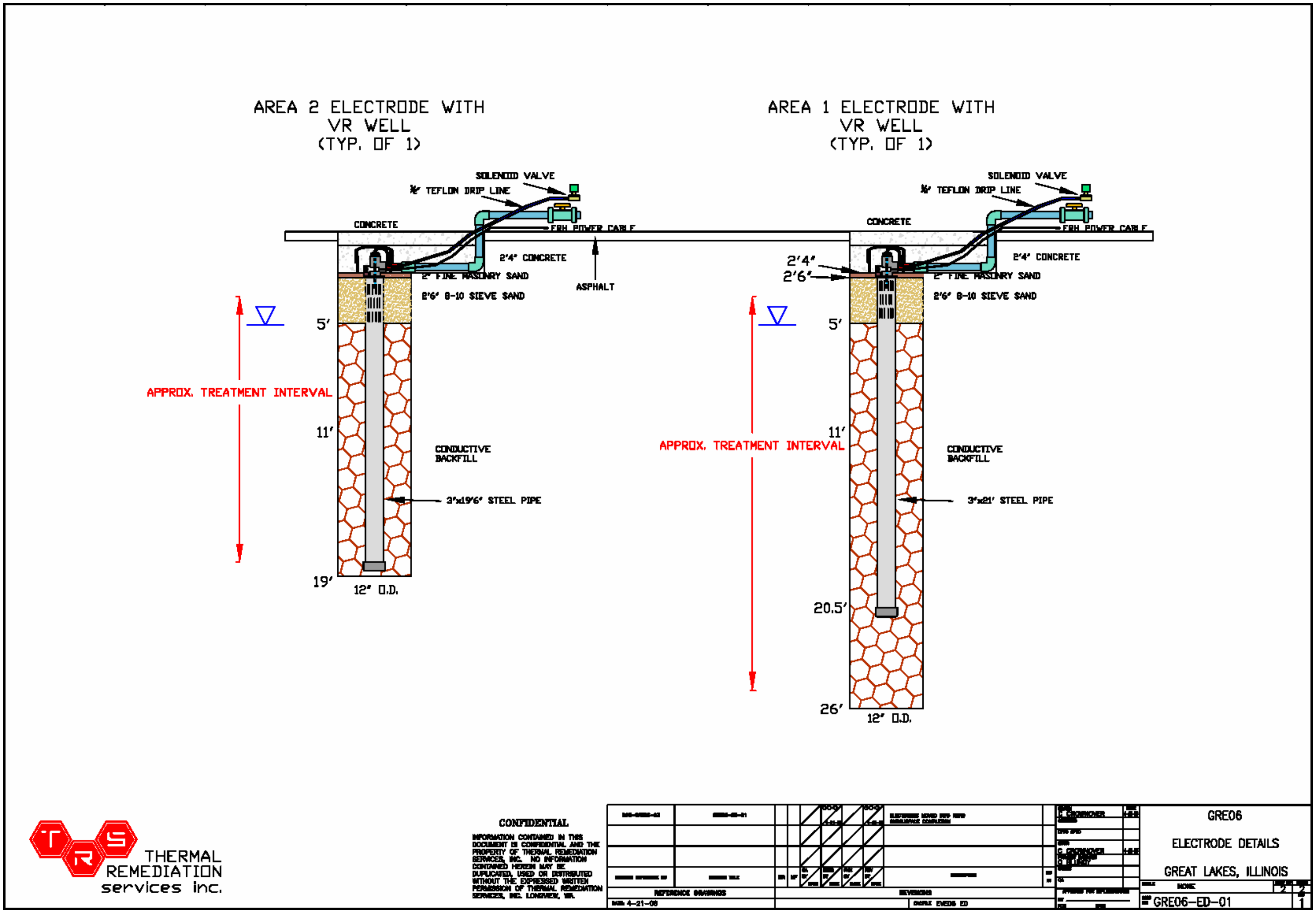

Figure 3. Trenched Electrode Design

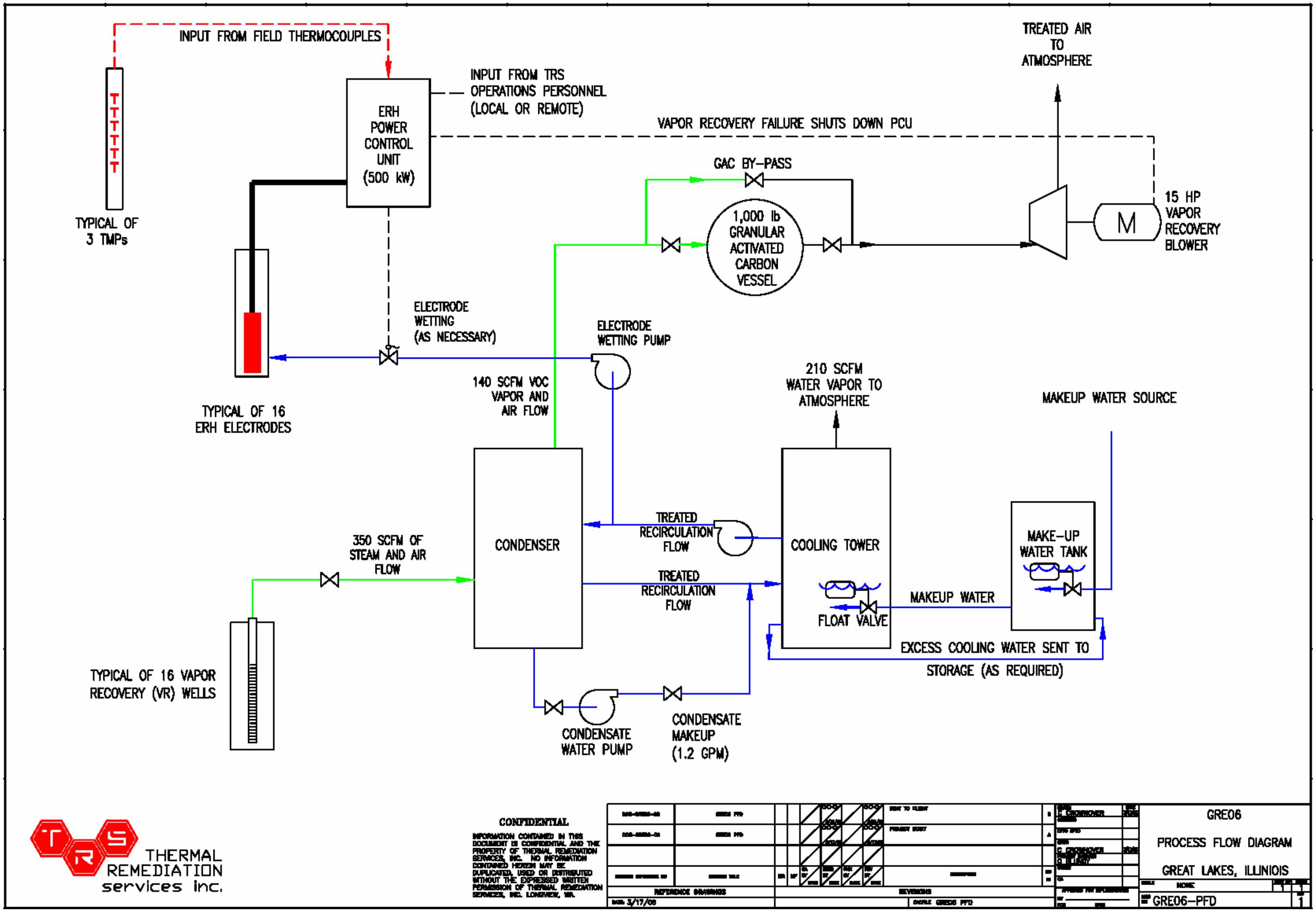

Figure 4. System Process Flow

Attachment A

TestAmerica
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Phone: (847) 808-7766
Fax: (847) 808-7772

Thermal Remediation Services	Project: GRE06	
1755 Afton Ave.	Project Number: GRE06	**Lab ID:** B605392
Charleston, SC 29407	Project Manager: Paul Lansing	**Reported:** 06/02/06 09:02

Volatile Organic Compounds by EPA Method 8260B

TestAmerica Analytical - Buffalo Grove

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
GRE06INF052506 (B605392-01) Air (Bag)	**Sampled: 05/25/06 10:05**		**Received: 05/25/06 11:47**						**QC**
Acetone	ND	10.0	ug/l	1	6050621	05/30/06	05/30/06	8260 Mod.	
Benzene	ND	2.00	"	"	"	"	"	"	
Bromodichloromethane	ND	2.00	"	"	"	"	"	"	
Bromoform	ND	2.00	"	"	"	"	"	"	
Bromomethane	ND	2.00	"	"	"	"	"	"	
2-Butanone	ND	10.0	"	"	"	"	"	"	
Carbon disulfide	ND	2.00	"	"	"	"	"	"	
Carbon tetrachloride	ND	2.00	"	"	"	"	"	"	
Chlorobenzene	ND	2.00	"	"	"	"	"	"	
Chlorodibromomethane	ND	2.00	"	"	"	"	"	"	
Chloroethane	ND	2.00	"	"	"	"	"	"	
Chloroform	ND	2.00	"	"	"	"	"	"	
Chloromethane	ND	2.00	"	"	"	"	"	"	
1,1-Dichloroethane	ND	2.00	"	"	"	"	"	"	
1,2-Dichloroethane	ND	2.00	"	"	"	"	"	"	
1,1-Dichloroethene	ND	2.00	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	2.00	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	2.00	"	"	"	"	"	"	
1,2-Dichloropropane	ND	2.00	"	"	"	"	"	"	
1,3-Dichloropropene (cis + trans)	ND	2.00	"	"	"	"	"	"	
Ethylbenzene	ND	2.00	"	"	"	"	"	"	
2-Hexanone	ND	10.0	"	"	"	"	"	"	
Methylene chloride	ND	2.00	"	"	"	"	"	"	
4-Methyl-2-pentanone	ND	10.0	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	2.00	"	"	"	"	"	"	
Styrene	ND	2.00	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	2.00	"	"	"	"	"	"	
Tetrachloroethene	**84.9**	2.00	"	"	"	"	"	"	
Toluene	ND	2.00	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	2.00	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	2.00	"	"	"	"	"	"	
Trichloroethene	ND	2.00	"	"	"	"	"	"	
Trichlorofluoromethane	ND	2.00	"	"	"	"	"	"	
Vinyl acetate	ND	10.0	"	"	"	"	"	"	
Vinyl chloride	ND	2.00	"	"	"	"	"	"	
Total Xylenes	ND	4.00	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		*100 %*	*79.5-119*		"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		*119 %*	*70.9-155*		"	"	"	"	
Surrogate: Toluene-d8		*101 %*	*61.6-131*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*100 %*	*64.2-126*		"	"	"	"	

TestAmerica
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Thermal Remediation Services	Project: GRE06	
1755 Afton Ave.	Project Number: GRE06	**Lab ID:** B605434
Charleston, SC 29407	Project Manager: Paul Lansing	**Reported:** 06/06/06 15:06

Volatile Organic Compounds by EPA Method 8260B

TestAmerica Analytical - Buffalo Grove

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Note
GRE06INF053106 (B605434-01) Air (Bag)	**Sampled: 05/31/06 09:05**		**Received: 05/31/06 10:55**						**Q(**
Acetone	ND	50.0	ug/l	5	6060027	06/01/06	06/01/06	8260 Mod.	
Benzene	ND	10.0	"	"	"	"	"	"	
Bromodichloromethane	ND	10.0	"	"	"	"	"	"	
Bromoform	ND	10.0	"	"	"	"	"	"	
Bromomethane	ND	10.0	"	"	"	"	"	"	
2-Butanone	ND	50.0	"	"	"	"	"	"	
Carbon disulfide	ND	10.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	10.0	"	"	"	"	"	"	
Chlorobenzene	ND	10.0	"	"	"	"	"	"	
Chlorodibromomethane	ND	10.0	"	"	"	"	"	"	
Chloroethane	ND	10.0	"	"	"	"	"	"	
Chloroform	ND	10.0	"	"	"	"	"	"	
Chloromethane	ND	10.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	10.0	"	"	"	"	"	"	
1,2-Dichloroethane	ND	10.0	"	"	"	"	"	"	
1,1-Dichloroethene	ND	10.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	10.0	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	10.0	"	"	"	"	"	"	
1,2-Dichloropropane	ND	10.0	"	"	"	"	"	"	
1,3-Dichloropropene (cis + trans)	ND	10.0	"	"	"	"	"	"	
Ethylbenzene	ND	10.0	"	"	"	"	"	"	
2-Hexanone	ND	50.0	"	"	"	"	"	"	
Methylene chloride	ND	10.0	"	"	"	"	"	"	
4-Methyl-2-pentanone	ND	50.0	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	10.0	"	"	"	"	"	"	
Styrene	ND	10.0	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	10.0	"	"	"	"	"	"	
Tetrachloroethene	**1060**	10.0	"	"	"	"	"	"	
Toluene	ND	10.0	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	10.0	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	10.0	"	"	"	"	"	"	
Trichloroethene	ND	10.0	"	"	"	"	"	"	
Trichlorofluoromethane	ND	10.0	"	"	"	"	"	"	
Vinyl acetate	ND	50.0	"	"	"	"	"	"	
Vinyl chloride	ND	10.0	"	"	"	"	"	"	
Total Xylenes	ND	20.0	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		*93.2 %*	*79.5-119*		*"*	*"*	*"*	*"*	
Surrogate: 1,2-Dichloroethane-d4		*122 %*	*70.9-155*		*"*	*"*	*"*	*"*	
Surrogate: Toluene-d8		*101 %*	*61.6-131*		*"*	*"*	*"*	*"*	
Surrogate: 4-Bromofluorobenzene		*101 %*	*64.2-126*		*"*	*"*	*"*	*"*	

Thermal Remediation Services 2325 Hudson St. Longview, WA 98632	Project: GRE06 Project Number: GRE06 Project Manager: Paul Lansing	**Lab ID:** B606078 **Reported:** 06/14/06 16:06

Volatile Organic Compounds by EPA Method 8260B

TestAmerica Analytical - Buffalo Grove

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
GRE06INF060706 (B606078-01) Air (Bag)	**Sampled: 06/07/06 13:30**	**Received: 06/07/06 14:35**							**QC**
Acetone	ND	50.0	ug/l	5	6060153	06/08/06	06/09/06	8260 Mod.	
Benzene	ND	10.0	"	"	"	"	"	"	
Bromodichloromethane	ND	10.0	"	"	"	"	"	"	
Bromoform	ND	10.0	"	"	"	"	"	"	
Bromomethane	ND	10.0	"	"	"	"	"	"	
2-Butanone	ND	50.0	"	"	"	"	"	"	
Carbon disulfide	ND	10.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	10.0	"	"	"	"	"	"	
Chlorobenzene	ND	10.0	"	"	"	"	"	"	
Chlorodibromomethane	ND	10.0	"	"	"	"	"	"	
Chloroethane	ND	10.0	"	"	"	"	"	"	
Chloroform	ND	10.0	"	"	"	"	"	"	
Chloromethane	ND	10.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	10.0	"	"	"	"	"	"	
1,2-Dichloroethane	ND	10.0	"	"	"	"	"	"	
1,1-Dichloroethene	ND	10.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	10.0	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	10.0	"	"	"	"	"	"	
1,2-Dichloropropane	ND	10.0	"	"	"	"	"	"	
1,3-Dichloropropene (cis + trans)	ND	10.0	"	"	"	"	"	"	
Ethylbenzene	ND	10.0	"	"	"	"	"	"	
2-Hexanone	ND	50.0	"	"	"	"	"	"	
Methylene chloride	ND	10.0	"	"	"	"	"	"	
4-Methyl-2-pentanone	ND	50.0	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	10.0	"	"	"	"	"	"	
Styrene	ND	10.0	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	10.0	"	"	"	"	"	"	
Tetrachloroethene	**854**	10.0	"	"	"	"	"	"	
Toluene	ND	10.0	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	10.0	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	10.0	"	"	"	"	"	"	
Trichloroethene	ND	10.0	"	"	"	"	"	"	
Trichlorofluoromethane	ND	10.0	"	"	"	"	"	"	
Vinyl acetate	ND	50.0	"	"	"	"	"	"	
Vinyl chloride	ND	10.0	"	"	"	"	"	"	
Total Xylenes	ND	20.0	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		*102 %*	*79.5-119*		"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		*128 %*	*70.9-155*		"	"	"	"	
Surrogate: Toluene-d8		*101 %*	*61.6-131*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*104 %*	*64.2-126*		"	"	"	"	

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1380 Busch Parkway
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Thermal Remediation Services	Project: GRE06	
2325 Hudson St.	Project Number: GRE06	**Lab ID:** B606164
Longview, WA 98632	Project Manager: Paul Lansing	**Reported:** 06/19/06 19:32

Volatile Organic Compounds by EPA Method 8260B

TestAmerica Analytical - Buffalo Grove

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
GRE INF 061306 (B606164-01) Air (Bag)	**Sampled: 06/13/06 12:52**		**Received: 06/13/06 13:50**						**G21, QC**
Acetone	ND	50.0	ug/l	5	6060346	06/16/06	06/19/06	8260 Mod.	
Benzene	ND	10.0	"	"	"	"	"	"	
Bromodichloromethane	ND	10.0	"	"	"	"	"	"	
Bromoform	ND	10.0	"	"	"	"	"	"	
Bromomethane	ND	10.0	"	"	"	"	"	"	
2-Butanone	ND	50.0	"	"	"	"	"	"	
Carbon disulfide	ND	10.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	10.0	"	"	"	"	"	"	
Chlorobenzene	ND	10.0	"	"	"	"	"	"	
Chlorodibromomethane	ND	10.0	"	"	"	"	"	"	
Chloroethane	ND	10.0	"	"	"	"	"	"	
Chloroform	ND	10.0	"	"	"	"	"	"	
Chloromethane	ND	10.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	10.0	"	"	"	"	"	"	
1,2-Dichloroethane	ND	10.0	"	"	"	"	"	"	
1,1-Dichloroethene	ND	10.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	10.0	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	10.0	"	"	"	"	"	"	
1,2-Dichloropropane	ND	10.0	"	"	"	"	"	"	
1,3-Dichloropropene (cis + trans)	ND	10.0	"	"	"	"	"	"	
Ethylbenzene	ND	10.0	"	"	"	"	"	"	
2-Hexanone	ND	50.0	"	"	"	"	"	"	
Methylene chloride	ND	10.0	"	"	"	"	"	"	
4-Methyl-2-pentanone	ND	50.0	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	10.0	"	"	"	"	"	"	
Styrene	ND	10.0	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	10.0	"	"	"	"	"	"	
Tetrachloroethene	**780**	10.0	"	"	"	"	"	"	
Toluene	ND	10.0	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	10.0	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	10.0	"	"	"	"	"	"	
Trichloroethene	ND	10.0	"	"	"	"	"	"	
Trichlorofluoromethane	ND	10.0	"	"	"	"	"	"	
Vinyl acetate	ND	50.0	"	"	"	"	"	"	
Vinyl chloride	ND	10.0	"	"	"	"	"	"	
Total Xylenes	ND	20.0	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		*98.4 %*	*79.5-119*		"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		*116 %*	*70.9-155*		"	"	"	"	
Surrogate: Toluene-d8		*99.6 %*	*61.6-131*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*104 %*	*64.2-126*		"	"	"	"	

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Thermal Remediation Services	Project: GRE06	
2325 Hudson St.	Project Number: GRE06	**Lab ID:** B606252
Longview, WA 98632	Project Manager: Paul Lansing	**Reported:** 06/26/06 15:03

Volatile Organic Compounds by EPA Method 8260B

TestAmerica Analytical - Buffalo Grove

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
GRE06062106 (B606252-01) Air (Bag)	**Sampled: 06/21/06 11:50**	**Received: 06/21/06 14:00**							**QC**
Acetone	ND	50.0	ug/l	5	6060471	06/22/06	06/23/06	8260 Mod.	
Benzene	ND	10.0	"	"	"	"	"	"	
Bromodichloromethane	ND	10.0	"	"	"	"	"	"	
Bromoform	ND	10.0	"	"	"	"	"	"	
Bromomethane	ND	10.0	"	"	"	"	"	"	
2-Butanone	ND	50.0	"	"	"	"	"	"	
Carbon disulfide	ND	10.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	10.0	"	"	"	"	"	"	
Chlorobenzene	ND	10.0	"	"	"	"	"	"	
Chlorodibromomethane	ND	10.0	"	"	"	"	"	"	
Chloroethane	ND	10.0	"	"	"	"	"	"	
Chloroform	ND	10.0	"	"	"	"	"	"	
Chloromethane	ND	10.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	10.0	"	"	"	"	"	"	
1,2-Dichloroethane	ND	10.0	"	"	"	"	"	"	
1,1-Dichloroethene	ND	10.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	10.0	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	10.0	"	"	"	"	"	"	
1,2-Dichloropropane	ND	10.0	"	"	"	"	"	"	
1,3-Dichloropropene (cis + trans)	ND	10.0	"	"	"	"	"	"	
Ethylbenzene	ND	10.0	"	"	"	"	"	"	
2-Hexanone	ND	50.0	"	"	"	"	"	"	
Methylene chloride	ND	10.0	"	"	"	"	"	"	
4-Methyl-2-pentanone	ND	50.0	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	10.0	"	"	"	"	"	"	
Styrene	ND	10.0	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	10.0	"	"	"	"	"	"	
Tetrachloroethene	**1140**	10.0	"	"	"	"	"	"	
Toluene	ND	10.0	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	10.0	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	10.0	"	"	"	"	"	"	
Trichloroethene	ND	10.0	"	"	"	"	"	"	
Trichlorofluoromethane	ND	10.0	"	"	"	"	"	"	
Vinyl acetate	ND	50.0	"	"	"	"	"	"	
Vinyl chloride	ND	10.0	"	"	"	"	"	"	
Total Xylenes	ND	20.0	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		*96.8 %*	*79.5-119*		*"*	*"*	*"*	*"*	
Surrogate: 1,2-Dichloroethane-d4		*120 %*	*70.9-155*		*"*	*"*	*"*	*"*	
Surrogate: Toluene-d8		*100 %*	*61.6-131*		*"*	*"*	*"*	*"*	
Surrogate: 4-Bromofluorobenzene		*106 %*	*64.2-126*		*"*	*"*	*"*	*"*	

Thermal Remediation Services 2325 Hudson St. Longview, WA 98632	Project: GRE06 Project Number: GRE06 Project Manager: C. Blundy	**Lab ID:** B606325 **Reported:** 06/30/06 15:30

Volatile Organic Compounds by EPA Method 8260B

TestAmerica Analytical - Buffalo Grove

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
GRE06 INF 062706 (B606325-01) Air (Bag)	**Sampled: 06/27/06 10:30**		**Received: 06/27/06 12:30**						**QC**
Acetone	ND	100	ug/l	10	6060593	06/28/06	06/29/06	8260 Mod.	
Benzene	ND	20.0	"	"	"	"	"	"	
Bromodichloromethane	ND	20.0	"	"	"	"	"	"	
Bromoform	ND	20.0	"	"	"	"	"	"	
Bromomethane	ND	20.0	"	"	"	"	"	"	
2-Butanone	ND	100	"	"	"	"	"	"	
Carbon disulfide	ND	20.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	20.0	"	"	"	"	"	"	
Chlorobenzene	ND	20.0	"	"	"	"	"	"	
Chlorodibromomethane	ND	20.0	"	"	"	"	"	"	
Chloroethane	ND	20.0	"	"	"	"	"	"	
Chloroform	ND	20.0	"	"	"	"	"	"	
Chloromethane	ND	20.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	20.0	"	"	"	"	"	"	
1,2-Dichloroethane	ND	20.0	"	"	"	"	"	"	
1,1-Dichloroethene	ND	20.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	20.0	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	20.0	"	"	"	"	"	"	
1,2-Dichloropropane	ND	20.0	"	"	"	"	"	"	
1,3-Dichloropropene (cis + trans)	ND	20.0	"	"	"	"	"	"	
Ethylbenzene	ND	20.0	"	"	"	"	"	"	
2-Hexanone	ND	100	"	"	"	"	"	"	
Methylene chloride	ND	20.0	"	"	"	"	"	"	
4-Methyl-2-pentanone	ND	100	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	20.0	"	"	"	"	"	"	
Styrene	ND	20.0	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	20.0	"	"	"	"	"	"	
Tetrachloroethene	**1290**	20.0	"	"	"	"	"	"	
Toluene	ND	20.0	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	20.0	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	20.0	"	"	"	"	"	"	
Trichloroethene	ND	20.0	"	"	"	"	"	"	
Trichlorofluoromethane	ND	20.0	"	"	"	"	"	"	
Vinyl acetate	ND	100	"	"	"	"	"	"	
Vinyl chloride	ND	20.0	"	"	"	"	"	"	
Total Xylenes	ND	40.0	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		*103 %*	*79.5-119*		"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		*122 %*	*70.9-155*		"	"	"	"	
Surrogate: Toluene-d8		*100 %*	*61.6-131*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*102 %*	*64.2-126*		"	"	"	"	

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Thermal Remediation Services	Project: GRE06	
2325 Hudson St.	Project Number: GRE06	**Lab ID:** B607008
Longview, WA 98632	Project Manager: C. Blundy	**Reported:** 07/17/06 18:26

Volatile Organic Compounds by EPA Method 8260B

TestAmerica Analytical - Buffalo Grove

GRE06INF070506 (B607008-01) Air (Bag) Sampled: 07/05/06 14:00 Received: 07/05/06 15:00 O15, QC

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acetone	ND	50.0	ug/l	5	6070232	07/17/06	07/17/06	8260 Mod.	
Benzene	ND	10.0	"	"	"	"	"	"	
Bromodichloromethane	ND	10.0	"	"	"	"	"	"	
Bromoform	ND	10.0	"	"	"	"	"	"	
Bromomethane	ND	10.0	"	"	"	"	"	"	
2-Butanone	ND	50.0	"	"	"	"	"	"	
Carbon disulfide	ND	10.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	10.0	"	"	"	"	"	"	
Chlorobenzene	ND	10.0	"	"	"	"	"	"	
Chlorodibromomethane	ND	10.0	"	"	"	"	"	"	
Chloroethane	ND	10.0	"	"	"	"	"	"	
Chloroform	ND	10.0	"	"	"	"	"	"	
Chloromethane	ND	10.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	10.0	"	"	"	"	"	"	
1,2-Dichloroethane	ND	10.0	"	"	"	"	"	"	
1,1-Dichloroethene	ND	10.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	10.0	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	10.0	"	"	"	"	"	"	
1,2-Dichloropropane	ND	10.0	"	"	"	"	"	"	
1,3-Dichloropropene (cis + trans)	ND	10.0	"	"	"	"	"	"	
Ethylbenzene	ND	10.0	"	"	"	"	"	"	
2-Hexanone	ND	50.0	"	"	"	"	"	"	
Methylene chloride	ND	10.0	"	"	"	"	"	"	
4-Methyl-2-pentanone	ND	50.0	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	10.0	"	"	"	"	"	"	
Styrene	ND	10.0	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	10.0	"	"	"	"	"	"	
Tetrachloroethene	**1050**	10.0	"	"	"	"	"	"	
Toluene	ND	10.0	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	10.0	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	10.0	"	"	"	"	"	"	
Trichloroethene	ND	10.0	"	"	"	"	"	"	
Trichlorofluoromethane	ND	10.0	"	"	"	"	"	"	
Vinyl acetate	ND	50.0	"	"	"	"	"	"	
Vinyl chloride	ND	10.0	"	"	"	"	"	"	
Total Xylenes	ND	20.0	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		*101 %*	*79.5-119*		"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		*111 %*	*70.9-155*		"	"	"	"	
Surrogate: Toluene-d8		*101 %*	*61.6-131*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*101 %*	*64.2-126*		"	"	"	"	

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Thermal Remediation Services	Project: GRE06	
2325 Hudson St.	Project Number: GRE06	**Lab ID:** B607157
Longview, WA 98632	Project Manager: Paul Lansing	**Reported:** 07/24/06 13:02

Volatile Organic Compounds by EPA Method 8260B
TestAmerica - Buffalo Grove, IL

GRE06INF071806 (B607157-01) Air (Bag) Sampled: 07/18/06 12:30 Received: 07/18/06 16:02 **QC**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acetone	ND	50.0	ug/l	5	6070327	07/21/06	07/21/06	8260 Mod.	
Benzene	ND	10.0	"	"	"	"	"	"	
Bromodichloromethane	ND	10.0	"	"	"	"	"	"	
Bromoform	ND	10.0	"	"	"	"	"	"	
Bromomethane	ND	10.0	"	"	"	"	"	"	
2-Butanone	ND	50.0	"	"	"	"	"	"	
Carbon disulfide	ND	10.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	10.0	"	"	"	"	"	"	
Chlorobenzene	ND	10.0	"	"	"	"	"	"	
Chlorodibromomethane	ND	10.0	"	"	"	"	"	"	
Chloroethane	ND	10.0	"	"	"	"	"	"	
Chloroform	ND	10.0	"	"	"	"	"	"	
Chloromethane	ND	10.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	10.0	"	"	"	"	"	"	
1,2-Dichloroethane	ND	10.0	"	"	"	"	"	"	
1,1-Dichloroethene	ND	10.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	10.0	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	10.0	"	"	"	"	"	"	
1,2-Dichloropropane	ND	10.0	"	"	"	"	"	"	
1,3-Dichloropropene (cis + trans)	ND	10.0	"	"	"	"	"	"	
Ethylbenzene	ND	10.0	"	"	"	"	"	"	
2-Hexanone	ND	50.0	"	"	"	"	"	"	
Methylene chloride	ND	10.0	"	"	"	"	"	"	
4-Methyl-2-pentanone	ND	50.0	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	10.0	"	"	"	"	"	"	
Styrene	ND	10.0	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	10.0	"	"	"	"	"	"	
Tetrachloroethene	**460**	10.0	"	"	"	"	"	"	
Toluene	ND	10.0	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	10.0	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	10.0	"	"	"	"	"	"	
Trichloroethene	**11.2**	10.0	"	"	"	"	"	"	
Trichlorofluoromethane	ND	10.0	"	"	"	"	"	"	
Vinyl acetate	ND	50.0	"	"	"	"	"	"	
Vinyl chloride	ND	10.0	"	"	"	"	"	"	
Total Xylenes	ND	20.0	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		*113 %*	*79.5-119*		"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		*118 %*	*70.9-155*		"	"	"	"	
Surrogate: Toluene-d8		*105 %*	*61.6-131*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*101 %*	*64.2-126*		"	"	"	"	

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Thermal Remediation Services	Project: GRE06	
2325 Hudson St.	Project Number: GRE06	**Lab ID:** B608016
Longview, WA 98632	Project Manager: Paul Lansing	**Reported:** 08/09/06 16:00

Volatile Organic Compounds by EPA Method 8260B

TestAmerica - Buffalo Grove, IL

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
GRE06INF080106 (B608016-01) Air (Bag)	**Sampled: 08/01/06 09:25**		**Received: 08/02/06 10:30**						**QC**
Acetone	ND	50.0	ug/l	5	6080099	08/07/06	08/08/06	8260 Mod.	
Benzene	ND	10.0	"	"	"	"	"	"	
Bromodichloromethane	ND	10.0	"	"	"	"	"	"	
Bromoform	ND	10.0	"	"	"	"	"	"	
Bromomethane	ND	10.0	"	"	"	"	"	"	
2-Butanone	ND	50.0	"	"	"	"	"	"	
Carbon disulfide	ND	10.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	10.0	"	"	"	"	"	"	
Chlorobenzene	ND	10.0	"	"	"	"	"	"	
Chlorodibromomethane	ND	10.0	"	"	"	"	"	"	
Chloroethane	ND	10.0	"	"	"	"	"	"	
Chloroform	ND	10.0	"	"	"	"	"	"	
Chloromethane	ND	10.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	10.0	"	"	"	"	"	"	
1,2-Dichloroethane	ND	10.0	"	"	"	"	"	"	
1,1-Dichloroethene	ND	10.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	10.0	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	10.0	"	"	"	"	"	"	
1,2-Dichloropropane	ND	10.0	"	"	"	"	"	"	
1,3-Dichloropropene (cis + trans)	ND	10.0	"	"	"	"	"	"	
Ethylbenzene	ND	10.0	"	"	"	"	"	"	
2-Hexanone	ND	50.0	"	"	"	"	"	"	
Methylene chloride	ND	10.0	"	"	"	"	"	"	
4-Methyl-2-pentanone	ND	50.0	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	10.0	"	"	"	"	"	"	
Styrene	ND	10.0	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	10.0	"	"	"	"	"	"	
Tetrachloroethene	**399**	10.0	"	"	"	"	"	"	
Toluene	ND	10.0	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	10.0	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	10.0	"	"	"	"	"	"	
Trichloroethene	ND	10.0	"	"	"	"	"	"	
Trichlorofluoromethane	ND	10.0	"	"	"	"	"	"	
Vinyl acetate	ND	50.0	"	"	"	"	"	"	
Vinyl chloride	ND	10.0	"	"	"	"	"	"	
Total Xylenes	ND	20.0	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		*90.2 %*	*79.5-119*		"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		*114 %*	*70.9-155*		"	"	"	"	
Surrogate: Toluene-d8		*94.6 %*	*61.6-131*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*92.8 %*	*64.2-126*		"	"	"	"	

Thermal Remediation Services	Project: GREO6	
2325 Hudson St.	Project Number: GRE06	**Lab ID:** B608174
Longview, WA 98632	Project Manager: C. Blundy	**Reported:** 08/25/06 13:49

Volatile Organic Compounds by EPA Method 8260B

TestAmerica - Buffalo Grove, IL

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
GRE06 INF 081606 (B608174-01RE1) Air (Bag)	**Sampled: 08/16/06 15:00**		**Received: 08/16/06 16:15**						**O15, QC**
Acetone	ND	10.0	ug/l	1	6080353	08/18/06	08/23/06	8260 Mod.	
Benzene	ND	2.00	"	"	"	"	"	"	
Bromodichloromethane	ND	2.00	"	"	"	"	"	"	
Bromoform	ND	2.00	"	"	"	"	"	"	
Bromomethane	ND	2.00	"	"	"	"	"	"	
2-Butanone	ND	10.0	"	"	"	"	"	"	
Carbon disulfide	ND	2.00	"	"	"	"	"	"	
Carbon tetrachloride	ND	2.00	"	"	"	"	"	"	
Chlorobenzene	ND	2.00	"	"	"	"	"	"	
Chlorodibromomethane	ND	2.00	"	"	"	"	"	"	
Chloroethane	ND	2.00	"	"	"	"	"	"	
Chloroform	ND	2.00	"	"	"	"	"	"	
Chloromethane	ND	2.00	"	"	"	"	"	"	
1,1-Dichloroethane	ND	2.00	"	"	"	"	"	"	
1,2-Dichloroethane	ND	2.00	"	"	"	"	"	"	
1,1-Dichloroethene	ND	2.00	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	2.00	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	2.00	"	"	"	"	"	"	
1,2-Dichloropropane	ND	2.00	"	"	"	"	"	"	
1,3-Dichloropropene (cis + trans)	ND	2.00	"	"	"	"	"	"	
Ethylbenzene	ND	2.00	"	"	"	"	"	"	
2-Hexanone	ND	10.0	"	"	"	"	"	"	
Methylene chloride	**2.34**	2.00	"	"	"	"	"	"	
4-Methyl-2-pentanone	ND	10.0	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	2.00	"	"	"	"	"	"	
Styrene	ND	2.00	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	2.00	"	"	"	"	"	"	
Tetrachloroethene	**40.3**	2.00	"	"	"	"	"	"	
Toluene	ND	2.00	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	2.00	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	2.00	"	"	"	"	"	"	
Trichloroethene	ND	2.00	"	"	"	"	"	"	
Trichlorofluoromethane	ND	2.00	"	"	"	"	"	"	
Vinyl acetate	ND	10.0	"	"	"	"	"	"	
Vinyl chloride	ND	2.00	"	"	"	"	"	"	
Total Xylenes	ND	4.00	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		*126 %*	*79.5-119*		"	"	"	"	H
Surrogate: 1,2-Dichloroethane-d4		*128 %*	*70.9-155*		"	"	"	"	
Surrogate: Toluene-d8		*102 %*	*61.6-131*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*99.4 %*	*64.2-126*		"	"	"	"	

Thermal Remediation Services	Project: GREO6	
2325 Hudson St.	Project Number: GRE06	**Lab ID:** B608324
Longview, WA 98632	Project Manager: C. Blundy	**Reported:** 09/07/06 16:58

Volatile Organic Compounds by EPA Method 8260B

TestAmerica - Buffalo Grove, IL

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
GRE06INF083006 (B608324-01) Air (Bag)	**Sampled: 08/30/06 10:10**		**Received: 08/30/06 13:20**						**QC**
Acetone	ND	10.0	ug/l	1	6090005	09/01/06	09/07/06	8260 Mod.	
Benzene	ND	2.00	"	"	"	"	"	"	
Bromodichloromethane	ND	2.00	"	"	"	"	"	"	
Bromoform	ND	2.00	"	"	"	"	"	"	
Bromomethane	ND	2.00	"	"	"	"	"	"	
2-Butanone	ND	10.0	"	"	"	"	"	"	
Carbon disulfide	ND	2.00	"	"	"	"	"	"	
Carbon tetrachloride	ND	2.00	"	"	"	"	"	"	
Chlorobenzene	ND	2.00	"	"	"	"	"	"	
Chlorodibromomethane	ND	2.00	"	"	"	"	"	"	
Chloroethane	ND	2.00	"	"	"	"	"	"	
Chloroform	ND	2.00	"	"	"	"	"	"	
Chloromethane	ND	2.00	"	"	"	"	"	"	
1,1-Dichloroethane	ND	2.00	"	"	"	"	"	"	
1,2-Dichloroethane	ND	2.00	"	"	"	"	"	"	
1,1-Dichloroethene	ND	2.00	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	2.00	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	2.00	"	"	"	"	"	"	
1,2-Dichloropropane	ND	2.00	"	"	"	"	"	"	
1,3-Dichloropropene (cis + trans)	ND	2.00	"	"	"	"	"	"	
Ethylbenzene	**2.10**	2.00	"	"	"	"	"	"	
2-Hexanone	ND	10.0	"	"	"	"	"	"	
4-Methyl-2-pentanone	ND	10.0	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	2.00	"	"	"	"	"	"	
Styrene	ND	2.00	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	2.00	"	"	"	"	"	"	
Tetrachloroethene	**67.1**	2.00	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	2.00	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	2.00	"	"	"	"	"	"	
Trichloroethene	**3.62**	2.00	"	"	"	"	"	"	
Trichlorofluoromethane	ND	2.00	"	"	"	"	"	"	
Vinyl acetate	ND	10.0	"	"	"	"	"	"	
Vinyl chloride	ND	2.00	"	"	"	"	"	"	
Total Xylenes	**9.15**	4.00	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		*82.6 %*	*79.5-119*		"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		*74.6 %*	*70.9-155*		"	"	"	"	
Surrogate: Toluene-d8		*96.4 %*	*61.6-131*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*107 %*	*64.2-126*		"	"	"	"	

Attachment B

TestAmerica ANALYTICAL TESTING CORPORATION

1380 Busch Parkway
Buffalo Grove, Illinois 60089

Phone: (847) 808-7766
Fax: (847) 808-7772

Thermal Remediation Services	Project: GRE06	
1755 Afton Ave.	Project Number: GRE06	**Lab ID:** B605434
Charleston, SC 29407	Project Manager: Paul Lansing	**Reported:** 06/06/06 15:06

Volatile Organic Compounds by EPA Method 8260B

TestAmerica Analytical - Buffalo Grove

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
GRE06CT053106 (B605434-02RE1) Water	**Sampled: 05/31/06 10:05**		**Received: 05/31/06 10:55**						**QC**
Acetone	ND	10.0	ug/l	1	6060012	06/02/06	06/02/06	EPA 8260B	
Benzene	ND	2.00	"	"	"	"	"	"	
Bromodichloromethane	ND	2.00	"	"	"	"	"	"	
Bromoform	ND	1.00	"	"	"	"	"	"	
Bromomethane	ND	2.00	"	"	"	"	"	"	
2-Butanone	ND	10.0	"	"	"	"	"	"	
Carbon disulfide	ND	2.00	"	"	"	"	"	"	
Carbon tetrachloride	ND	2.00	"	"	"	"	"	"	
Chlorobenzene	ND	2.00	"	"	"	"	"	"	
Chlorodibromomethane	ND	2.00	"	"	"	"	"	"	
Chloroethane	ND	2.00	"	"	"	"	"	"	
Chloroform	ND	2.00	"	"	"	"	"	"	
Chloromethane	ND	2.00	"	"	"	"	"	"	
1,1-Dichloroethane	ND	2.00	"	"	"	"	"	"	
1,2-Dichloroethane	ND	2.00	"	"	"	"	"	"	
1,1-Dichloroethene	ND	2.00	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	2.00	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	2.00	"	"	"	"	"	"	
1,2-Dichloropropane	ND	2.00	"	"	"	"	"	"	
1,3-Dichloropropene (cis + trans)	ND	2.00	"	"	"	"	"	"	
Ethylbenzene	ND	2.00	"	"	"	"	"	"	
2-Hexanone	ND	10.0	"	"	"	"	"	"	
Methylene chloride	ND	2.00	"	"	"	"	"	"	
4-Methyl-2-pentanone	ND	10.0	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	2.00	"	"	"	"	"	"	
Styrene	ND	2.00	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	2.00	"	"	"	"	"	"	
Tetrachloroethene	ND	2.00	"	"	"	"	"	"	
Toluene	ND	2.00	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	2.00	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	2.00	"	"	"	"	"	"	
Trichloroethene	ND	2.00	"	"	"	"	"	"	
Trichlorofluoromethane	ND	2.00	"	"	"	"	"	"	
Vinyl acetate	ND	10.0	"	"	"	"	"	"	
Vinyl chloride	ND	2.00	"	"	"	"	"	"	
Total Xylenes	ND	4.00	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		*106 %*	*69.8-133*		"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		*99.6 %*	*61.2-141*		"	"	"	"	
Surrogate: Toluene-d8		*98.4 %*	*75.8-118*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*87.8 %*	*68.9-123*		"	"	"	"	

APPENDIX B

WELL ABANDONMENT FORMS AND WELL CONSTRUCTION DIAGRAMS

1/95

WATER WELL SEALING FORM

ILLINOIS DEPARTMENT OF PUBLIC HEALTH
DIVISION OF ENVIRONMENTAL HEALTH
525 WEST JEFFERSON STREET
SPRINGFIELD, ILLINOIS 62761

RETURN ALL COPIES TO IDPH OR LOCAL HEALTH DEPARTMENT

TYPE OR PRESS FIRMLY 22 MW055

[redacted]

1. Ownership (Name of Controlling Party) UNITED STATES NAVY
2. Well Location: NTC GREAT LAKES FORMER BLDG 105 NW CORNER OF SAMPSON ST. @ PORTER AVENUE GREAT LAKES LAKE
   Address - Lot Number City County

   General Description: Township 44 (N)(S) Range 12 (E)(W) Section 4

   ______ Quarter of the ______ Quarter of the ______ Quarter

   NORTHING 2,057,358.28
   EASTING 1,117,718.39
   ELEVATION 649.031

3. Year Drilled 2003
4. Drilling Permit Number (and date, if known) N/A
5. Type of Well: Bored ______ Drilled ✓ Other ______
6. Total Depth 24 FEET Diameter(inches) 8 1/4" BOREHOLE - 2 INCH PVC
7. Formation clear of obstruction ✓ Yes ______ No
8. DETAILS OF PLUGGING

   Filled with CEMENT-BENTONITE SLURRY from 24.0 to GROUND SURFACE ft.
   (cement or other materials)

   Kind of plug ______ from ______ to ______ ft.

   Filled with ______ from ______ to ______ ft.

   Kind of plug ______ from ______ to ______ ft.

   Filled with ______ from ______ to ______ ft.

   Kind of plug ______ from ______ to ______ ft.

9. CASING RECORD: Upper 3 feet of casing removed ✓ Yes ______ No
10. Date well was sealed: Month APRIL Day 25 Year 2006.
11. Licensed water well driller or other person approved by the Department performing well sealing.

NEIL WIKTOR / TTL ASSOCIATES
Name

N/A
Complete License Number

1915 N. 12TH STREET
Address

TOLEDO
City

OH 43624
State/Zip

This State Agency is requesting disclosure of information that is necessary to accomplish the statutory purpose as outlined under Public Act 85-0863. Disclosure of this information is mandatory. This form has been approved by the Forms Management Center.

IL 482-0631

1/95

WATER WELL SEALING FORM

ILLINOIS DEPARTMENT OF PUBLIC HEALTH
DIVISION OF ENVIRONMENTAL HEALTH
525 WEST JEFFERSON STREET
SPRINGFIELD, ILLINOIS 62761

RETURN ALL COPIES TO IDPH OR LOCAL HEALTH DEPARTMENT

TYPE OR PRESS FIRMLY 22MW0110D

[illegible]

1. Ownership (Name of Controlling Party) UNITED STATES NAVY

2. Well Location: NTC GREAT LAKES ~~FORMER BLDG 105~~ NW CORNER OF SAMPSON @ PORTER AVE. GREAT LAKES LAKE
   Address - Lot Number City County

   General Description: Township 44 (N)(S) Range 12 (E)(W) Section 4

   ________ Quarter of the ________ Quarter of the ________ Quarter

3. Year Drilled 2003 NORTHING 2,057,375.57 ELEVATION

4. Drilling Permit Number (and date, if known) N/A EASTING 1,117,751.88 649.5

5. Type of Well: Bored ____ Drilled ✓ Other ____

6. Total Depth 40 FEET Diameter (inches) 8¼" BOREHOLE - 2-IN PVC

7. Formation clear of obstruction ✓ Yes ____ No

8. DETAILS OF PLUGGING

   Filled with CEMENT - BENTONITE SLURRY from 40 FT. to GROUND SURFACE ft.
   (cement or other materials)

   Kind of plug ________ from ____ to ____ ft.

   Filled with ________ from ____ to ____ ft.

   Kind of plug ________ from ____ to ____ ft.

   Filled with ________ from ____ to ____ ft.

   Kind of plug ________ from ____ to ____ ft.

9. CASING RECORD: Upper 3 feet of casing removed ✓ Yes ____ No

10. Date well was sealed: Month APRIL Day 27 Year 2006.

11. Licensed water well driller or other person approved by the Department performing well sealing.

    NEIL WIKTOR / TTL ASSOCIATES, INC. N/A
    Name Complete License Number

    1915 N. 12TH ST. TOLEDO OH 43624
    Address City State/Zip

This State Agency is requesting disclosure of information that is necessary to accomplish the statutory purpose as outlined under Public Act 85-0863. Disclosure of this information is mandatory. This form has been approved by the Forms Management Center.

IL 482-0631

1/95

WATER WELL SEALING FORM

ILLINOIS DEPARTMENT OF PUBLIC HEALTH
DIVISION OF ENVIRONMENTAL HEALTH
525 WEST JEFFERSON STREET
SPRINGFIELD, ILLINOIS 62761

RETURN ALL COPIES TO IDPH OR LOCAL HEALTH DEPARTMENT

TYPE OR PRESS FIRMLY 22 MW010S

[redacted]

1. Ownership (Name of Controlling Party) UNITED STATES NAVY

2. Well Location: NTC GREAT LAKES FORMER BLDG 105 NW CORNER OF SAMPSON & PORTER GREAT LAKES LAKE
Address - Lot Number City County

General Description: Township 44 (N)(S) Range 12 (E)(W) Section 4

______ Quarter of the ______ Quarter of the ______ Quarter

NORTHING 2,057,368.91
EASTING 1,117,751.91
ELEVATION 649.5

3. Year Drilled 2003

4. Drilling Permit Number (and date, if known) N/A

5. Type of Well: Bored ____ Drilled ✓ Other ____

6. Total Depth 35 FEET Diameter(inches) 8 1/4" BOREHOLE - 2 INCH PVC

7. Formation clear of obstruction ✓ Yes ____ No

8. DETAILS OF PLUGGING

Filled with CEMENT-BENTONITE SLURRY from 35.0 to GROUND SURFACE ft.
(cement or other materials)

Kind of plug ____ from ____ to ____ ft.

Filled with ____ from ____ to ____ ft.

Kind of plug ____ from ____ to ____ ft.

Filled with ____ from ____ to ____ ft.

Kind of plug ____ from ____ to ____ ft.

9. CASING RECORD: Upper 3 feet of casing removed ✓ Yes ____ No

10. Date well was sealed: Month APRIL Day 27 Year 2006.

11. Licensed water well driller or other person approved by the Department performing well sealing.

NEIL WIKTOR / TTL ASSOCIATES
Name

N/A
Complete License Number

1915 N. 12TH ST.
Address

TOLEDO
City

OH 43629
State/Zip

This State Agency is requesting disclosure of information that is necessary to accomplish the statutory purpose as outlined under Public Act 85-0863. Disclosure of this information is mandatory. This form has been approved by the Forms Management Center.

IL 482-0631

1/95

WATER WELL SEALING FORM

ILLINOIS DEPARTMENT OF PUBLIC HEALTH
DIVISION OF ENVIRONMENTAL HEALTH
525 WEST JEFFERSON STREET
SPRINGFIELD, ILLINOIS 62761

RETURN ALL COPIES TO IDPH OR LOCAL HEALTH DEPARTMENT

TYPE OR PRESS FIRMLY   22 MW 065

[redacted]

1. Ownership (Name of Controlling Party) UNITED STATES NAVY

2. Well Location: NTC GREAT LAKES FORMER BLDG 105 NW CORNER OF SAMPSON ST. & PORTER AVE. GREAT LAKES LAKE
Address - Lot Number   City   County

General Description: Township 44 (N)(S) Range 12 (E)(W) Section 4

______ Quarter of the ______ Quarter of the ______ Quarter

NORTHING 2,057,364.69   ELEVATION 649.5

3. Year Drilled 2003

EASTING 1,117,751.98

4. Drilling Permit Number (and date, if known) N/A

5. Type of Well: Bored ______ Drilled ✓ Other ______

6. Total Depth 24 FEET Diameter(inches) 8 1/4" BOREHOLE - 2 INCH PVC

7. Formation clear of obstruction ✓ Yes ______ No

8. DETAILS OF PLUGGING

Filled with CEMENT-BENTONITE SLURRY from 24.0 to GROUND SURFACE ft.
(cement or other materials)

Kind of plug ______ from ______ to ______ ft.

Filled with ______ from ______ to ______ ft.

Kind of plug ______ from ______ to ______ ft.

Filled with ______ from ______ to ______ ft.

Kind of plug ______ from ______ to ______ ft.

9. CASING RECORD: Upper 3 feet of casing removed ✓ Yes ______ No

10. Date well was sealed: Month APRIL Day 27 Year 2006.

11. Licensed water well driller or other person approved by the Department performing well sealing.

NEIL WIKTOR / TTL ASSOCIATES, INC.   N/A
Name   Complete License Number

1915 N. 12TH STREET   TOLEDO   OH 43624
Address   City   State/Zip

This State Agency is requesting disclosure of information that is necessary to accomplish the statutory purpose as outlined under Public Act 85-0863. Disclosure of this information is mandatory. This form has been approved by the Forms Management Center.

IL 482-0631

APPENDIX C

WASTE DISPOSAL DOCUMENTATION

STATE OF ILLINOIS

ENVIRONMENTAL PROTECTION AGENCY DIVISION OF LAND POLLUTION CONTROL
P.O. BOX 19276 SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761

State Form LPC 62 8/81 IL532-0610

835424 / 835423

FOR SHIPMENT OF HAZARDOUS AND SPECIAL WASTE

PLEASE TYPE (Form designed for use on elite (12-pitch) typewriter.) EPA Form 8700-22 (Rev. 6-89) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. IL7170024577 Manifest Document No. ~~2327~~ mH 11486
2. Page 1 of 1

Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address
ACOS INSTALLATION AND ENVIRONMENT
201 DECATUR AVE
GREAT LAKES, IL 60088

Location If Different

4. "24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS" (847) 688 -4820

A. Illinois Manifest Document Number IL10823272 FEE PAID IF APPLICABLE
B. Generator's IL ID Number 0971125005

5. Transporter 1 Company Name POLLUTION CONTROL INDUSTRIES
6. US EPA ID Number IND000646943

C. Transporter's ID Number UPW-0446276-OH
D. Transporter's Phone (219)397-3951

7. Transporter 2 Company Name
8. US EPA ID Number

E. Transporter's ID Number
F. Transporter's Phone ( )

9. Designated Facility Name and Site Address
POLLUTION CONTROL INDUSTRIES
4343 KENNEDY AVE
EAST CHICAGO, IN 46312

10. US EPA ID Number IND000646943

G. Facility's IL ID Number
H. Facility's Phone (219) 397-3951

GENERATOR

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. WASTE, ENVIRONMENTALLY HAZARDOUS SUBSTANCES, LIQUID, N.O.S., 9, UN3082, PGIII (LABPACK) ERG#171	001	DM	00120	P	EPA HW Number F002
b.					EPA HW Number
c.					EPA HW Number
d.					EPA HW Number

J. Additional Description for Materials Listed Above
a) ZF

K. Handling Codes for Wastes Listed Above in Item #14
S01

C# E06101

15. Special Handling Instructions and Additional Information
a) E06101-1 (1x55DM)

P.O.C. Mr. Mark S. Hoyeer
COD Due to Mark S. Hoyeer within 45 days
Transporter Offered Placards (Driver's Int ___)

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: MARK S. Hoyer | Signature: Mark S Hoyer | Date Month Day Year: 021006

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: Matthew Dodge | Signature: Matthew Dodge | Date Month Day Year: 021006

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name | Signature | Date Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.
Printed/Typed Name: MARY MANCIC | Signature: Mary Mancic | Date Month Day Year: 021006

This Agency is authorized to require, pursuant to Illinois Revised Statute, 1989, Chapter 111 1/2, Section 1004 and 1021, that this information be submitted to the Agency. Failure to provide this information may result in a civil penalty against the owner or operator not to exceed $25,000 per day of violation. Falsification of this information may result in a fine up to $50,000 per day of violation and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

In case of emergency or spill call the Illinois Emergency Management Agency, Office of Emergency Response at 217/782-7860 and the National Response Center at 800/424-8802 or 202/426-2675.

PCI

Certificate

This certificate is to verify that the waste specified will be handled in accordance with all local, state, and federal regulations

Manifest: IL10823272
Generator: ACOS INSTALLATION AND ENVIRONMENT

Page/Line	Waste Stream	PCI H CODE
1 A	ZF	H061

Facility Name: Pollution Control Industries
Facility Address: 4343 Kennedy Avenue
East Chicago, IN 46312
Facility EPA ID: IND000646943

Signature:

Typed: Tita LaGrimas
Title: Executive Vice President of Regulatory Affairs
Date: 3/8/2006

Invoice #: 10071134

Pollution Control Industries
4343 Kennedy Avenue, East Chicago, IN 46312
(219)397-3951 FAX: (219)397-6411
www.pollutioncontrol.com

P.O. BOX 19276 SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761

FOR SHIPMENT OF HAZARDOUS AND SPECIAL WASTE

State Form LPC 62 8/81 IL532-0610

PLEASE TYPE (Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 6-89) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. IL7170024577 Manifest Document No. 11493

2. Page 1 of 1

Information in the shaded areas is not required by Federal law, but is required by Illinois law.

3. Generator's Name and Mailing Address Location if Different

Acos Installation and Environment
201 Decatur Ave.
Great Lakes, IL 60088

4. *24 HOUR EMERGENCY AND SPILL ASSISTANCE NUMBERS* 847-688-4820

A. Illinois Manifest Document Number IL11856884 FEE PAID IF APPLICABLE

B. Generator's IL ID Number 0971215510015

5. Transporter 1 Company Name: Pollution Control Industries

6. US EPA ID Number: IND000646943

C. Transporter's ID Number UPW-0446276-OH

D. Transporter's Phone (219) 397-3951

7. Transporter 2 Company Name

8. US EPA ID Number

E. Transporter's ID Number

F. Transporter's Phone ( )

9. Designated Facility Name and Site Address

Pollution Control Industries
4343 Kennedy Ave
East Chicago, IN 46312

10. US EPA ID Number: IND000646943

G. Facility's IL ID Number

H. Facility's Phone (219) 397-3951

GENERATOR

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. RQ(F002),Hazardous Waste, Solid, n.o.s. (Tetrachloroethylene,Trichloroethane),9, NA3077, PGII	001	CM	30	YD	EPA HW Number F002
b.					EPA HW Number
c.					EPA HW Number
d.					EPA HW Number

J. Additional Description for Materials Listed Above

A. 307200, contaminated soil, ERG 171

K. Handling Codes for Wastes Listed Above In Item #14

A) S02

15. Special Handling Instructions and Additional Information

P.O.C Mr. Mark S. Hoyer
C.O.D. Due to Mr. Mark S.Hoyer within 45 days
Transporter Offered Placards(Drivers Initials LB)

24 Hour Emergency Response:847-688-4820

C#37915

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Date Month Day Year
Luigi F. Abbate		050906

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date Month Day Year
Larry Baker		050906

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.

Printed/Typed Name	Signature	Date Month Day Year
MELISSA TUCKER		050906

In case of a spill call the Illinois Office of Emergency Response at 217/782-7860 and the National Response Center at 800/424-8802 or 202/426-2675.

COPY 1. TSD MAIL TO GENERATOR

8354244/8354234

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number: IL7170024577
2. Page 1 of: 1
3. Emergency Response Phone: 847-688-4820
4. Manifest Tracking Number: 000602005 JJK

5. Generator's Name and Mailing Address:
ACOS Installation and Environment
201 Decatur Ave.
Great Lakes, IL 60038

Generator's Site Address (if different than mailing address)

Generator's Phone:

6. Transporter 1 Company Name: Pollution Control Industries — U.S. EPA ID Number: IND000646943

7. Transporter 2 Company Name: — U.S. EPA ID Number:

8. Designated Facility Name and Site Address:
Pollution Control Industries
4343 Kennedy Ave.
East Chicago, IN 46312

Facility's Phone: (800-388-7242) — U.S. EPA ID Number: IND000646943

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes		
	1. RQ,(F002), Hazardous Waste Solid,N.O.S. (Tetrachloroethylene,Trichloroethane), ~~9,NA3077, PGII~~	10	Dm	550	G	F002		
	2. Non-RCRA, Non-DOT Regulated (Cooling Tower Water)	4 ~~5~~	Dm	220	G	none		
	3.							
	4.							

14. Special Handling Instructions and Additional Information
1.) 307200, Contaminated Soil, ERG. 171
2.) 289456, Cooling Tower Water
Transporter offered Placards(Driver Initials___)

P.O.C. Mr. Mark S. Hoyer
C.O.D. due to Mr. Mark Hoyer within 45 days
#11283

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

CH48206

Generator's/Offeror's Printed/Typed Name: Norman Lucas — Signature: Norman Lucas — Month/Day/Year: 03/14/07

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

17. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: Vasili Samios — Signature: — Month/Day/Year: 03/14/07
Transporter 2 Printed/Typed Name: — Signature: — Month/Day/Year:

18. Discrepancy
18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

18b. Alternate Facility (or Generator) — U.S. EPA ID Number

Facility's Phone:

18c. Signature of Alternate Facility (or Generator) — Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.
H141	NA		

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
Printed/Typed Name: Yvonne Hoffman — Signature: Yvonne Hoffman — Month/Day/Year: 03/14/07

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

PCI

Certificate

This certificate is to verify that the waste specified will be handled in accordance with all local, state, and federal regulations

Manifest: 000602005JJK
Generator: ACOS INSTALLATION AND ENVIRONMENT

Page/Line	Waste Stream	PCI H CODE
1 1	307200	H141
1 2	289456	NA

Facility Name: Pollution Control Industries
Facility Address: 4343 Kennedy Avenue
East Chicago, IN 46312
Facility EPA ID: IND000646943

Signature:

Typed: Tita LaGrimas
Title: Executive Vice President of Regulatory Affairs
Date: 3/22/2007

Invoice #: 10081877

Pollution Control Industries
4343 Kennedy Avenue, East Chicago, IN 46312
(219)397-3951 FAX: (219)397-6411
www.pollutioncontrol.com

APPENDIX D

FIELD LOG SHEETS

NOVEMBER 2005

Tetra Tech NUS, Inc.

GROUNDWATER LEVEL MEASUREMENT SHEET

Project Name: NAVAL STATION GREAK LAKES
Project No.: 00202 CTO 00009 (CLEAN IV)
Location: GREAT LAKES, ILLINIOS
Personnel: Jeff Schubert
Weather Conditions: partly cloudy, ~ 28°F
Measuring Device: M-Scope
Tidally Influenced: Yes ___ No ✓
Remarks:

Well or Piezometer Number	Date	Time	Elevation of Reference Point (feet)*	Total Well Depth (feet)*	Water Level Indicator Reading (feet)*	Groundwater Elevation (feet)*	Comments
NTC~~DX~~22MW01S	11-20-05	18:18		Not Accessible (water filling the well box, needs to be cleaned out)			
NTC~~DX~~22MW02S	11-21-05	12:00			7.20		
NTC~~DX~~22MW03S	11-20-05	17:37			6.42		PID = 0.0 ppm
NTC~~DX~~22MW04S	11-20-05	17:48			2.17		plug off of riser
NTC~~04~~22MW05S	11-20-05	10:15			6.08		PID = 0.0 ppm
NTC~~DX~~22MW06S	11-20-05	15:22			5.53		PID = 68.7 ppm
NTC~~DX~~22MW07S	11-21-05	11:45			7.07		PID = 0.0
NTC~~DX~~22MW07D		Not Accessible (see below)					
NTC~~DX~~22MW08S	11-20-05	18:02			5.13		PID = 0.0 ppm
NTC~~DX~~22MW09S		Not Accessible (see below)					
NTC~~DX~~22MW10S	11-20-05	13:55			5.13		PID = 0.0 ppm
NTC~~DX~~22MW10D	11-20-05	12:11			5.15		PID = 0.0 ppm
NTC22MW01S	11-21-05	11:15			4.44		water pumped out of well box with peristaltic pump ~~and well box~~ cleaned out with paper towels before J-plug was removed

MW09S -- filled with mud and cement up to side of Jplug. Could not clean it out sufficiently to safely pull the J-plug. Needs to be cleaned out more thoroughly.

MW07 well box is filled with wet sticky bentonite clay. Clay pellets must have expanded and pushed up into well box. Needs to be thoroughly cleaned out before J-plug is removed

* All measurements to the nearest 0.01 foot

All wells need new J-plugs and locks.

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NAVAL STATION GREAT LAKES
PROJECT NUMBER: 00202 CTO 0009 (CLEAN IV)

WELL ID.: NTC22MW05S
DATE: 11/20/05

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (gal/L)	Flowrate (mL/min)	pH (S.U.)	Spec. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments
10:35	6.20									PID=0.0
10:44	started pumping									when well
10:48	7.74			6.94	2.829	40	0.53	17.83	+32.3	opened
10:55			250 ml/min	6.98	2.811	21	0.46	17.69	-22.5	turned down
										pumping rate
11:01			140 mL/min							
11:07			150	7.01	2.811	13	0.53	17.37	-42.6	
11:15	7.79			7.04	2.800	11	0.52	17.26	-49.3	
11:20	~~7~~		150	7.04	2.795	~~11~~	0.52	17.29	-54.2	water
11:24	7.91			~~7.06~~	~~2.791~~	11	~~0.53~~	~~17.32~~	-56.4	has
11:30				7.06	2.791		0.53	17.32	~~-56.4~~	some
11:33	8.09		150	7.06	2.789		0.52	17.34	-57.8	orange
11:38	8.20		150	7.07	2.785	9.0	0.46	17.27	-58.9	iron
11:40				7.07	2.782		0.47	17.27	-59.5	floc in
										it
11:45	pump off									
		total pumped ≅ 3 gallons								

SIGNATURE(S): Jeff Schubert

19 feet of tubing in well

PAGE 1 OF 1

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NAVAL STATION GREAT LAKES
Project No.: 00202 CTO 00009 (CLEAN IV)

[] Domestic Well Data
[x] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: NTC22MW05S02
Sample Location: NTC22MW05S
Sampled By: Jeff Schubert
C.O.C. No.: 245252
Type of Sample:
[x] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 11-20-05	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	ODOR
Time: 11:40	Visual	Standard	mS/cm	°C	NTU	mg/l		
Method: Low flow	small amt. of iron floc	7.07	2.782	17.27	9.0	0.47	-59.5	none

PURGE DATA:

Date: 11-20-05	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	ORP	Flow Rate
Method: Low Flow Peristaltic pump								
Monitor Reading (ppm): 0.0								
Well Casing Diameter & Material								
Type: 2" PVC								
Total Well Depth (TD): 24.0								
Static Water Level (WL): 6.20								
One Casing Volume(gal/L):								
Start Purge (hrs): 10:44								
End Purge (hrs): 11:45								
Total Purge Time (min): 61								
Total Vol. Purged (gal/L): ~3								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
VOCs 8260B	HCl	3 40-mL vials	✓ JPS

OBSERVATIONS / NOTES:

Iron floc in groundwater during purging and sampling; started to clear up during purging.

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): Jeffrey P. Schubert

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NAVAL STATION GREAT LAKES
PROJECT NUMBER: 00202 CTO 0009 (CLEAN IV)

WELL ID.: NTC22MW06S
DATE: 11-20-05

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (gal/L)	Flowrate (mL/min)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments
15:18										opened well
15:22	5.53									PID = 68.7 ppm
15:25	pump started									
15:28				7.20	2.716	3.7	1.38	16.61	116.8	
15:31			220							turned down pump rate
15:33	7.52		140							
15:35	~~8.08~~			7.21	2.870		0.65	17.46	34.3	
15:36	8.08									
15:39			135			3.7				
15:41				7.21	2.850		0.61	17.36	3.4	
15:43	9.04									
~~15:49~~										
15:51			140			2.3				
15:55				7.20	2.831		0.55	17.34	-31.8	
15:57	11.05									
16:06	12.84			7.20	2.650		0.49	17.15	-50.4	
16:12	13.76		135			3.8				
16:15				7.21	2.224		0.50	17.00	-54.3	
16:20				7.22	2.097		0.50	16.82	-53.6	
16:22	14.32									
16:26			145	7.22	1.997	6.7	0.48	17.12	-49.5	
16:30	14.64			7.22	2.058		0.50	17.04	-48.0	
16:33				7.22	2.155	6.7	0.53	16.97	-46.8	
16:37			135	7.20	2.347	5.4	0.60	16.84	-43.6	
16:42	15.10			7.19	2.422		0.60	16.67	-39.8	
16:47	15.27			7.19	2.444		0.65	16.98	-38.2	
17:00	15.88		140	7.19	2.722	5.3	0.62	17.16	-34.8	

SIGNATURE(S): Jeffrey P. Schubert

PAGE 1 OF 1

19 ~~feet~~ of tubing in well during purging

Tubing placed down to bottom of well at 15:25 to check for DNAPLs. None were detected using small sample and Oil Red. Tubing was lifted up 5 feet during purging (i.e. intake @ 19 ft bgs).

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NAVAL STATION GREAT LAKES
Project No.: 00202 CTO 00009 (CLEAN IV)

[] Domestic Well Data
[x] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: NTC22MW06S02
Sample Location: NTC22MW06S
Sampled By: Jeff Schubert
C.O.C. No.: 245252
Type of Sample:
[x] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	ODOR
Date: 11-20-05								
Time: 17:00	Visual	Standard	mS/cm	°C	NTU	mg/l		
Method: Low-Flow	clear	7.19	2.722	17.16	5.3	0.62	-34.8	slight solvent odor

PURGE DATA:

Date: 11-20-05	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	ORP	Flow Rate
Method: Low Flow Peristaltic Pump								
Monitor Reading (ppm): 68.7 ppm; reading was 91.7 ppm on 11-19-05								
Well Casing Diameter & Material								
Type: 2" PVC								
Total Well Depth (TD): 24.0								
Static Water Level (WL): 5.53								
One Casing Volume(gal/L):								
Start Purge (hrs): 15:25								
End Purge (hrs): 17:00								
Total Purge Time (min): 95								
Total Vol. Purged (gal/L): ~4 gallons								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
VOCs 8260B	HCl	3 40-mL vials	✓ JPS

OBSERVATIONS / NOTES:

sample (~100 mL) was collected from bottom of well ~~prior to~~ at the beginning of low-flow purging. This sample was checked with Oil Red dye to determine whether DNAPL was present. No DNAPL was detected. Tubing was raised immediately to middle of well screen.

Circle if Applicable:

MS/MSD: No

Duplicate ID No.: NTC22FD03

Signature(s): Jeffrey P. Schubert

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NAVAL STATION GREAT LAKES
PROJECT NUMBER: 00202 CTO 0009 (CLEAN IV)

air temp = ~~13~~ 4 °C

WELL ID.: NTC22MW10S
DATE: 11-20-05

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (gal/L)	Flowrate (mL/min)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments
13:55	5.13									
14:05	started pumping									
14:10			~~140~~							
14:12				7.58	1.355	0.60	0.81	16.80	-122.7	
14:15	5.21			7.59	1.353	0.20	0.68	16.83	-129.3	
14:28	5.21		150	7.60	1.348	0.00	0.52	16.81	-136.7	
14:40				7.59	1.342	0.00	0.51	16.47	-136.4	
14:43	5.21		140	~~7.59~~	~~1.338~~		~~0.51~~	~~16.48~~	~~-136.4~~	
14:46				7.59	1.338		0.51	16.48	-136.4	
14:54				7.59	1.340		0.52	16.59	-136.7	
14:57	5.21		140	~~7.59~~	~~1.340~~	~~0.00~~	~~0.52~~	~~16.45~~	~~-136.6~~	
15:00		~3 1/2 gallons total		7.59	1.340	0.00	0.52	16.45	-136.6	

SIGNATURE(S): Jeffrey Schubert

PAGE 1 OF 1

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name:	NAVAL STATION GREAT LAKES	Sample ID No.:	NTC22MW10S02
Project No.:	00202 CTO 00009 (CLEAN IV)	Sample Location:	NTC22MW10S
		Sampled By:	Jeff Schubert
[] Domestic Well Data		C.O.C. No.:	245252
[x] Monitoring Well Data		Type of Sample:	
[] Other Well Type:		[x] Low Concentration	
[] QA Sample Type:		[] High Concentration	

SAMPLING DATA:

Date: 11-20-05	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	ODOR
Time: 15:00	Visual	Standard	mS/cm	°C	NTU	mg/l		
Method: Low Flow	clear	7.59	1.340	16.45	0.00	0.52	-136.6	none

PURGE DATA:

Date: 11-20-05	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	ORP	Flow Rate
Method: Low Flow Peristaltic Pump								
Monitor Reading (ppm): 0.0								
Well Casing Diameter & Material								
Type: 2" PVC								
Total Well Depth (TD): 35.0								
Static Water Level (WL): 5.13								
One Casing Volume(gal/L):								
Start Purge (hrs): 14:05								
End Purge (hrs): 15:00								
Total Purge Time (min): 0:55								
Total Vol. Purged (gal/L): ~3 ½ gallons								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
VOCs 8260B	HCl	3 40-mL vials	✓ JPS

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): Jeffrey P. Schubert

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NAVAL STATION GREAT LAKES

PROJECT NUMBER: 00202 CTO 0009 (CLEAN IV)

air temp = 11.8°C

WELL ID.: NTC22MW10D

DATE: 11-20-05

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (gal/L)	Flowrate (mL/min)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments
12:08										well opened
12:11	5.15									PID ≤ 0.0 inside casing
12:26	started pumping									
12:30				7.63	1.326		1.82	16.57	-0.4	
12:32	5.20		150			2.9				
12:36				7.70	1.309		1.50	16.90	-91.3	clear
12:40			150	7.67	1.307	1.9	1.09	16.89	-105.7	
12:45	5.20									
12:50	5.23		150	7.65	1.304	2.1	0.86	16.87	-116.7	clear
13:04	5.23		150	7.64	1.305	2.1	0.66	16.97	-122.5	
13:11			150	7.64	1.302	1.8	0.61	17.01	-125.6	
13:16	5.24			7.64	1.298		0.57	16.97	-126.9	clear
13:22			150	~~7.64~~	~~1.299~~	2.8	~~0.51~~	~~16.88~~	~~-129.6~~	
13:30	5.25		150	7.64	1.299	1.1	0.51	16.88	-129.6	
13:37	pump off									

SIGNATURE(S): Jeff Schubert

PAGE 1 OF 1

38' of tubing placed down well

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NAVAL STATION GREAT LAKES
Project No.: 00202 CTO 00009 (CLEAN IV)

[] Domestic Well Data
[x] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: NTC22MW10D02
Sample Location: NTC22MW10D
Sampled By: Jeff Schubert
C.O.C. No.: 245252
Type of Sample:
[x] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 11-20-05	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	ODOR
Time: 13:30	Visual	Standard	mS/cm	°C	NTU	mg/l		
Method: Low-flow	clear	7.64	1.299	16.88	1.1	0.51	-129.6	none

PURGE DATA:

Date: 11-20-05	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	ORP	Flow Rate
Method: Low Flow, Peristaltic Pump								
Monitor Reading (ppm): 0.0								
Well Casing Diameter & Material								
Type: 2" PVC								
Total Well Depth (TD): 40.0								
Static Water Level (WL): 5.15								
One Casing Volume(gal/L):								
Start Purge (hrs): 12:26								
End Purge (hrs): 13.37								
Total Purge Time (min): 71								
Total Vol. Purged (gal/L): ~3½								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
VOCs 8260B	HCl	3 40-mL vials	✓ JPS

OBSERVATIONS / NOTES:

Circle If Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): Jeffrey P. Schubert

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NAVAL STATION GREAT LAKES
PROJECT NUMBER: 00202 CTO 0009 (CLEAN IV)
DRILLING COMPANY: Env. Field Services
DRILLING RIG: DPT Geoprobe / F-550 truck
BORING NUMBER: NTC22SB20
DATE: 11-17-05
GEOLOGIST: Jeff Schubert
DRILLER: Josh Dutton

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth /Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
	1						drove drive point past asphalt, gravel, and very soft base material						
	2						(no core, no recovery)						
	3												
1st core	4		41"/48"	4'			sand, black cinders sluff material			0			
	5						soft to med. stiff, silty clay greenish gray, some lt. brown mottling						
	6								collected soil sample				
	7								NTC22SB20-0203	0	0	0	0
2nd core	8		42"/48"				(same as above)						
	9												
	10								NTC22SB20-0506	0	0	0	0
	11						11 ft bottom of boring						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: collected soil samples NTC22SB200203 and NTC22SB200506 at 24-31" and 60-68 inches below cinders and fill material

Converted to Well: Yes ____ No ✓

Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NAVAL STATION GREAT LAKES
PROJECT NUMBER: 00202 CTO 0009 (CLEAN IV)
DRILLING COMPANY: Env. Field Services
DRILLING RIG: DPT Geoprobe/F550 truck
BORING NUMBER: NTC22SB21
DATE: 11-17-05
GEOLOGIST: Jeff Schubert
DRILLER: Joshua Dutton

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth /Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
						drive point driven through				0			
	1					2 ft of hard asphalt and							
						gravel base, then through							
	2					2 ft of soft material (base)							
	3					(no core/no recovery)							
	4												
1st core	5		1"/36"				almost no recovery						
	6						cinders, very soft material						
	7			7'									
2nd core	8		37"/48"				soft to med. stiff, clay, silty			0			
	9						tan and greenish gray,		soil sample				
							wet		NTC22SB210203		0	0	0
	10												
	11												
	12												

* When rock coring, enter rock brokeness.
** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: sample NTC22SB210203 collected from 2-3 feet below cinders and soft fill materials

Drilling Area Background (ppm): 0

Converted to Well: Yes ____ No ✓ Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NAVAL STATION GREAT LAKES
BORING NUMBER: NTC 22SB21
PROJECT NUMBER: 00202 CTO 0009 (CLEAN IV)
DATE: 11-17-05
DRILLING COMPANY: Env. Field Services
GEOLOGIST: J. Schubert
DRILLING RIG: DPT Geoprobe/F-550 truck
DRILLER: J. Dutton

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth /Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
3rd core									collected samples				
	12					soft to med. stiff			NTC22SB2104	17			
			38"/			silty clay, greenish			-05 and	-40 ppm			
	13		48"			gray, with some			~~NTC22SB~~ NTC22FD01				
						tan mottlong				0			
	14					wet							
	15												
4th core	16												
			46"/			same as above							
	17		48"										
	18												
									soil sample NTC22SB21-	0	0	0	0
	19								1112				
						19 ft bottom of hole							

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: PID readings in upper portion of core 3 (11-13 ft bgs) were between 17-40 ppm in core when broken open; Field dupl. collected at same location as NTC22SB210405

Converted to Well: Yes ____ No ✓ Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NAVAL STATION GREAT LAKES
PROJECT NUMBER: 00202 CTO 0009 (CLEAN IV)
DRILLING COMPANY: Env. Field Services
DRILLING RIG: DPT Geoprobe / F-550 truck
BORING NUMBER: NTC22SB22
DATE: 11-17-05
GEOLOGIST: J. Schubert
DRILLER: J. Dutton

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth /Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	Sample	Sampler BZ	Borehole**	Driller BZ**
	1						drive point						
							driven through						
	2						about 3 ft						
							of hard asphaft,						
	3						gravel, and						
							possibly concrete						
	4												
							then pushed						
	5						down through						
							4 feet of soft						
	6						fill material						
							(no core / no						
	7						recovery)						
4 ft core										0			
	8						soft to med						
							stiff silty						
	9						clay, greenish		soil sample				
							gray with some		NTC22SB22-				
	10						tan mottling		0203				
							near top						
	11						wet, plastic						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: soil sample NTC22SB22023 collected from 2-3 feet below fill material (9-10 feet bgs)

Converted to Well: Yes ______ No ✓ Well I.D. #: ______

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NAVAL STATION GREAT LAKES
PROJECT NUMBER: 00202 CTO 0009 (CLEAN IV)
DRILLING COMPANY: Env. Field Services
DRILLING RIG: DPT Geoprobe/F-550 truck

BORING NUMBER: NTC22SB22
DATE: 11-19-05
GEOLOGIST: J Schubert
DRILLER: Joshua Dutton

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth /Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
2nd core										0			
	12						soft to med stiff						
							silty clay, greenish						
	13						gray with some						
							tan mottling		soil sample				
	14						wet in		NTC22SB22-0708	0	0	0	0
							places						
	15						plastic						
3rd core													
	16												
										0			
	17												
										17–			
	18								NTC22SB22-1112	26 ppm			
									and				
	19								NTC22FD02	0			
							19 ft bottom of hole						

* When rock coring, enter rock brokeness.
** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: field duplicate (NTC22FD02) collected with NTC22SB221112. PID readings of 17-26 ppm measured when middle of 3rd core broken open (16-18.5 ft bgs)

Converted to Well: Yes ____ No ✓ Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NAVAL STATION GREAT LAKES
BORING NUMBER: NTC22SB23
PROJECT NUMBER: 00202 CTO 0009 (CLEAN IV)
DATE: 11-17-05
DRILLING COMPANY: Env. Field Services
GEOLOGIST: Jeff Schubert
DRILLING RIG: DPT Geoprobe/F-550 truck
DRILLER: Joshua Dutton

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth /Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
						no core, drove drive				0			
	1					point down 18 inches							
1st core	2					gravel, sand, black							
			22"/			cinders, all non-							
	3		30"			natural base							
						material and fill							
	4			4'									
2nd core	5						soft to medium		collected soil samples				
			38"/				stiff silty clay						
	6		48"				greenish gray,		NTC22SB230102		0	0	0
							plastic						
	7								NTC22SB230203			0	0
	8												
						8 ft bottom of boring							

* When rock coring, enter rock brokeness.
** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: soil samples NTC22SB230102 and NTC22SB230203 collected from 18-22" and 30-32", respectively, below sand and fill material

Converted to Well: Yes ____ No ✓ Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NAVAL STATION GREAT LAKES
BORING NUMBER: NTC22SB24
PROJECT NUMBER: 00202 CTO 0009 (CLEAN IV)
DATE: 11-17-05
DRILLING COMPANY: Env. Field Services
GEOLOGIST: Jeff Schubert
DRILLING RIG: DPT Geoprobe/F-550 truck
DRILLER: J. Dutton

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth /Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
					no core, drove drive point through asphalt and gravel base (1½ ft)					0			
	1												
1st core	2		18"/30"				gravel, sand black cinders						
	3												
	4			4ft			bottom 1½ ft very soft, no resistance						
2nd core	5		38"/48"				soft to med. stiff silty clay, greenish gray, plastic		collected soil sample NTC22SB24 -0102	0	0	0	0
	6												
	7								NTC22SB24 0203	0	0	0	0
	8					8'	bottom of hole						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: samples NTC22SB240102 and NTC22SB240203 collected from 18-20" and 30-32" below bottom of fill material

Converted to Well: Yes ______ No ✓ Well I.D. #: ______

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NAVAL STATION GREAT LAKES
BORING NUMBER: NTC22SB25
PROJECT NUMBER: 00202 CTO 0009 (CLEAN IV)
DATE: 11-17-05
DRILLING COMPANY: Environmental Field Services
GEOLOGIST: Jeff Schubert
DRILLING RIG: DPT Geoprobe/ F-550 truck
DRILLER: Joshua Dutton

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth /Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
1st core	1			1'			pounded down through asphalt and gravel/no recovery		used drive point	0			
	2		1½ ft/ 3 ft	2'			gravel, sand, black cinders						
	3				very soft, no recovery								
	4			4 ft									
2nd core	5			~~xx~~			soft to med. stiff silty clay greenish-gray, plastic		collected soil sample NTC22SB25-0102	0	0	0	0
	6		32"/ 48"										
	7								NTC22SB25-0203	0	0	0	0
	8					8	ft bottom of hole						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: samples NTC22SB250102 and NTC22SB250203 collected 18 and 30 inches, respectively below asphalt, gravel and fill material

Converted to Well: Yes ___ No ✓ Well I.D. #: ___

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NAVAL STATION GREAT LAKES
Project No.: 00202 CTO 0009 (CLEAN IV)

[] Surface Soil
[✓] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: NTC22SB200203
Sample Location: NTC22SB20
Sampled By: Jeff Schubert
C.O.C. No.: 245250

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 11-17-05 Time: 14:20 Method: DPT Monitor Reading (ppm): 0.0	2-3 feet below bottom of fill (6-7 feet bgs)		silty clay, moist - wet soft to med. stiff, greenish gray

COMPOSITE SAMPLE DATA:

	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs 8260B	3 EnCore samples	✓ JPS	
soil moisture	1 jar	✓ JPS	

OBSERVATIONS / NOTES:

MAP:

see Field Log Book for boring location

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): Jeffrey P. Schubert

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NAVAL STATION GREAT LAKES
Project No.: 00202 CTO 0009 (CLEAN IV)

[] Surface Soil
[✓] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: NTC22SB200506
Sample Location: NTC22SB20
Sampled By: Jeff Schubert
C.O.C. No.: 245250

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 11-17-05 Time: 14:40 Method: DPT Monitor Reading (ppm): 0.0	5-6 feet below fill (9-10 feet bgs)		silty clay, moist to wet, soft to med. stiff, greenish gray

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs 8260B	3 Encore samples	✓ JPS	
soil moisture	1 jar	✓ JPS	

OBSERVATIONS / NOTES:

MAP:

see Field Log Book for boring Location

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): Jeffrey P. Schubert

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NAVAL STATION GREAT LAKES
Project No.: 00202 CTO 0009 (CLEAN IV)

[] Surface Soil
[✓] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: NTC22SB210203
Sample Location: NTC22SB21
Sampled By: Jeff Schubert
C.O.C. No.: 245250

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 11-17-05 Time: 15:15 Method: DPT Monitor Reading (ppm): 0.0	2-3 feet below cap and fill material (9-10 feet bgs)		silty clay, moist to wet, soft(?) to med. stiff, greenish gray

COMPOSITE SAMPLE DATA:

	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs 8260 B	3 Encore samples	✓ JPS	
soil moisture	1 jar	✓ JPS	

OBSERVATIONS / NOTES:

MAP:

see Field Log Book for boring location

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): Jeffrey P. Schubert

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NAVAL STATION GREAT LAKES
Project No.: 00202 CTO 0009 (CLEAN IV)

[] Surface Soil
[✓] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: NTC22SB210405
Sample Location: NTC22SB21
Sampled By: Jeff Schubert
C.O.C. No.: 245250

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 11-17-05	4-5 ft below caps and fill material (11-12 ft bgs)		silty clay, wet greenish gray, soft to med. stiff
Time: 15:45			
Method: DPT			
Monitor Reading (ppm): 17-40 ppm			

COMPOSITE SAMPLE DATA:

	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs 8260B	3 EnCore samples	✓JPS	
soil moisture	1 jar	✓JPS	

OBSERVATIONS / NOTES:

MAP:

see Field Log Book for Boring Location

Circle if Applicable:

~~MS/MSD~~	Duplicate ID No.:
No	NTC22 FD01

Signature(s): Jeffrey P. Schubert

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NAVAL STATION GREAT LAKES
Project No.: 00202 CTO 0009 (CLEAN IV)

[] Surface Soil
[✓] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: NTC22SB211112
Sample Location: NTC22SB21
Sampled By: Jeff Schubert
C.O.C. No.: 245250

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 11-17-05 Time: 16:00 Method: DPT Monitor Reading (ppm): 0.0	11-12 feet below cap and fill material (18-19 feet bgs)		silty clay, soft to med. stiff, wet greenish gray with some tan mottling

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs 8260B	3 EnCore samples	✓ JPS	
Soil moisture	1 jar	✓ JPS	

OBSERVATIONS / NOTES:

MAP:

see Field Log Book for boring location.

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): Jeffrey P. Schubert

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page 1 of 1

Project Site Name: NAVAL STATION GREAT LAKES
Project No.: 00202 CTO 0009 (CLEAN IV)

[] Surface Soil
[✓] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: NTC22SB220203
Sample Location: NTC22SB22
Sampled By: Jeff Schubert
C.O.C. No.: 245250

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 11-17-05 Time: 17:00 Method: DPT Monitor Reading (ppm):	2-3 ft below fill and cap material (9-10 ft bgs)		greenish gray silty clay with some orange mottling; soft to med. stiff, wet

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs 8260B	3 EnCore samplers	✓ JPS	
soil moisture	1 small screw-type jar	✓ JPS	

OBSERVATIONS / NOTES:

MAP:

See Field Log Book for boring location

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s): Jeffrey P. Schubert

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NAVAL STATION GREAT LAKES
Project No.: 00202 CTO 0009 (CLEAN IV)

[] Surface Soil
[✓] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: NTC22SB220708
Sample Location: NTC22SB22
Sampled By: Jeff Schubert
C.O.C. No.: 245250

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 11-17-05 Time: 17:10 Method: DPT Monitor Reading (ppm): 0.0	7-8 feet below cap and fill materials (11 - 15 ft bgs)		soft to med stiff silty clay, greenish gray; moist wetter in small intervals; plastic

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs, 8260 B	3 EnCore samplers	✓ 3 JPS	
soil moisture	~~1 plastic~~ JPS 1 plastic jar	✓ 1 JPS	

OBSERVATIONS / NOTES:

MAP:

See Field Log Book for boring location

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): Jeffrey P. Schubert

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NAVAL STATION GREAT LAKES
Project No.: 00202 CTO 0009 (CLEAN IV)

[] Surface Soil
[✓] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: NTC22SB2211 12
Sample Location: NTC22SB22
Sampled By: Jeff Schubert
C.O.C. No.: 2445250

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 11-17-05 Time: 17:30 Method: DPT Monitor Reading (ppm): 17-26 ppm	11-12 feet below cap and fill materials; 18-19 ft bgs.		soft to medium stiff silty clay. wet in localized intervals, plastic

COMPOSITE SAMPLE DATA:

	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs 8260B	12 EnCore samplers	✓ 12 JPS	
soil moisture	2 plastic jar	✓ 2 JPS	

— duplicate containers collected for duplicate sample NTC22FD02.
— 6 additional Encore samples collected for MS / MSD

OBSERVATIONS / NOTES:

MS, MSD, and duplicate colleted from this soil interval

MAP:

see Field Log Book for boring location

Circle if Applicable:

MS/MSD
Yes

Duplicate ID No.: NTC22FD02

Signature(s): Jeffrey P. Schubert

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NAVAL STATION GREAT LAKES
Project No.: 00202 CTO 0009 (CLEAN IV)

[] Surface Soil
[✓] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: NTC22SB230102
Sample Location: NTC22SB23
Sampled By: Jeff Schubert
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 11-17-05 Time: 13:10 Method: DPT Monitor Reading (ppm): 0.0	0-1 feet below fill and cap material (4-5 ft bgs)		soft to med. stiff silty clay; greenish-gray plastic, moist

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs 8260B	3 EnCore samples	✓ 3 JPS	
soil moisture	1 plastic jar	✓ 1 JPS	

OBSERVATIONS / NOTES:

MAP:

See Field Log Book for boring location

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s): Jeffrey P. Schubert

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NAVAL STATION GREAT LAKES
Project No.: 00202 CTO 0009 (CLEAN IV)

[] Surface Soil
[✓] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: NTC22SB230203
Sample Location: NTC22SB23
Sampled By: Jeff Schubert
C.O.C. No.: 245250

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 11-17-05 Time: 13:30 Method: DPT Monitor Reading (ppm): 0.0	2-3 ft below cap and fill materials (6-7 ft bgs)		soft to med. stiff silty clay, greenish gray, moist, plastic

COMPOSITE SAMPLE DATA:

	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs 8260B	3 EnCore samplers	✓ 3 JPS	
soil moisture	1 plastic jar	✓ 1 JPS	

OBSERVATIONS / NOTES:

MAP:

See Field Log Book for boring locations

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s): Jeffrey P. Schubert

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name:	NAVAL STATION GREAT LAKES	Sample ID No.:	NTC22SB240102
Project No.:	00202 CTO 0009 (CLEAN IV)	Sample Location:	NTC22SB24
		Sampled By:	Jeff Schubert
		C.O.C. No.:	245250

[] Surface Soil
[✓] Subsurface Soil
[] Sediment
[] Other: ______
[] QA Sample Type: ______

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 11-17-05 Time: 12:30 Method: DPT Monitor Reading (ppm): 0.0	1-2 feet below cap and fill materials (5-6 ft bgs)		greenish gray silty clay soft to medium stiff moist, plastic

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (8260B)	3 Encore samplers	✓ 3 JPS	
soil moisture	1 plastic jar	✓ 1 JPS	

OBSERVATIONS / NOTES:

MAP:

See Field Log Book for boring location

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): Jeffrey P. Schubert

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NAVAL STATION GREAT LAKES
Project No.: 00202 CTO 0009 (CLEAN IV)

[] Surface Soil
[✓] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: NTC22SB240203
Sample Location: NTC22SB24
Sampled By: Jeff Schubert
C.O.C. No.: 245250

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 11-17-05	2-3 feet below fill and cap material. (6-8 feet bgs)		greenish gray silty clay soft to med stiff; plastic
Time: 12:30			
Method: DPT			
Monitor Reading (ppm): 0.0			

COMPOSITE SAMPLE DATA:

	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs 8260B	3 EnCore samplers	3 ✓	PS
soil moisture	1 plastic jar	1 ✓	PS

OBSERVATIONS / NOTES:

MAP:

See Field Log Book for boring location.

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): Jeffrey P. Schubert

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page 1 of 1

Project Site Name: NAVAL STATION GREAT LAKES
Project No.: 00202 CTO 0009 (CLEAN IV)

[] Surface Soil
[✓] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: NTC22SB250102
Sample Location: NTC22SB25
Sampled By: Jeff Schubert
C.O.C. No.: 245251

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 11-17-05 Time: 11:30 Method: DPT Monitor Reading (ppm): 0.0	1-2 feet below cap and fill materials (5-6 ft bgs)		soft to med. stiff silty clay; greenish gray; moist, plastic

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs 8260B	3 EnCore samples	✓ 3 JPS	
soil moisture	1 plastic jar	✓ 1 JPS	

OBSERVATIONS / NOTES:

MAP:

See Field Log Book for boring location

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s): Jeffrey P. Schubert

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NAVAL STATION GREAT LAKES
Project No.: 00202 CTO 0009 (CLEAN IV)

Sample ID No.: NTC22SB250203
Sample Location: NTC22SB25
Sampled By: Jeff Schubert
C.O.C. No.: 245251

[] Surface Soil
[✓] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 11-17-05 Time: 11:40 Method: DPT Monitor Reading (ppm): 0.0	2-3 feet below cap and fill material (6-7 ft bgs)		greenish gray, silty ~~clay~~ soft to med. stiff, plastic, wet

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs 8260B	3 Encore Samplers	3 ✓ JPS	
soil moisture	1 plastic jar	1 ✓ JPS	

OBSERVATIONS / NOTES:

MAP:

See Field Log Book for boring location

Circle if Applicable:

MS/MSD | Duplicate ID No.:

Signature(s): Jeffrey P. Schubert

Tetra Tech NUS, Inc.

EQUIPMENT CALIBRATION LOG

PROJECT NAME : NAVAL STATION GREAT LAKES

SITE NAME: GREAT LAKES

PROJECT No.: 00202 CTO 0009 (CLEAN IV)

INSTRUMENT NAME/MODEL: Photovac 2020 PID

MANUFACTURER: PhotoVac

SERIAL NUMBER: ED GR 301

Date of Calibration	Instrument I.D. Number	Person Performing Calibration	Instrument Settings Pre-calibration	Instrument Settings Post-calibration	Instrument Readings Pre-calibration	Instrument Readings Post-calibration	Calibration Standard (Lot No.)	Remarks and Comments
11-17-05 8:15 am	EDGR301	JPS			99.3	100.0	100 ppm	(Lot No. 3695 Isobutylene gas) Spec/Air Gases & Technologies, Auburn, ME
11-19-05 10:00 am	EDGR301	JPS			98.7	100.0	"	
11-20-05 8:00 am	EDGR 301	JPS			99.5	100.0	"	
11-21-05 9:30 am	ED GR 301	JPS			98.8	100.0	"	

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DOCUMENTATION OF FIELD CALIBRATION

PROJECT NAME : NAVAL STATION GREAT LAKES

SITE NAME: GREAT LAKES

PROJECT No.: 00202 CTO 00009 (CLEAN IV)

INSTRUMENT NAME/MODEL: YSI 650 MDS Water Quality Meter

MANUFACTURER: YSI

SERIAL NUMBER: Sonde 01C0979 AA
~~Meter 03D09~~03 AB

Date of Calibration	Person Performing Calibration	INITIAL READINGS PH	COND	TURB	DO	TEMP	SAL	FINAL READINGS PH	COND	TURB	DO	TEMP	SAL	Calibration Standard (Lot No.)	Remarks and Comments
11-20-05	JPS	7.15	1.040		101.1%			7.00	0.999		100% (9.27 mg/L D.O.)				
9:00 am		3.91						4.00							
La Motte															
Turbidity Meter															
11-20-05	JPS			0.0						0.0				Sp. Cond Cal Standard	
9:30 am				10.0						10.0				Lot 4958 Exp. 6-23-06	
														pH 7.0 buffer	
														Aurical Co.	
														Lot No. 5014	
														Exp. 8-12-2007	
														pH 4.0 buffer	
														Aurical Co.	
														Lot. No. 4804	
														Exp. 01-25-2007	

JULY 2006

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NAVAL STATION GREAT LAKES
Project No.: 112G00202 CTO 0009

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: NTC22SB200203R
Sample Location: NTC22SB20
Sampled By: MLM
C.O.C. No.: 3794

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 7/11/06 Time: 0830 Method: ENCORE Monitor Reading (ppm):	2'-3'		SILTY CLAY and some sand.

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
CVOCS	3 5gm ENCORE	✓	
MOISTURE	2oz PlASTIC	✓	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s): Mark L. Mengel

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NAVAL STATION GREAT LAKES
Project No.: 112G00202 CTO 0009

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: NTC22SB200607 R
Sample Location: NTC22SB20
Sampled By: MLM
C.O.C. No.: 3794

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 7-11-06 Time: 0835 Method: ENCORE Monitor Reading (ppm):	6'-7'		SILTY CLAY, greenish grey soft

COMPOSITE SAMPLE DATA:

	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
CVOCS	3 5-gram ENCORE	✓	
MOISTURE	2 oz PLASTIC	✓	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): Mark L. Mengel

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NAVAL STATION GREAT LAKES
Project No.: 112G00202 CTO 0009

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: NTCMW05SB0001R
Sample Location: NTC MW05S
Sampled By: MLM
C.O.C. No.: 3794

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 7-11-06	0-1		SILTY CLAY, soft
Time: 0900			
Method: ENCORE			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
CVOCs	3 5-gram ENCOREs	✓	
MOISTURE	2oz PLASTIC	✓	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): Mark L. Mengel

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NAVAL STATION GREAT LAKES
Project No.: 112G00202 CTO 0009

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: GL95105$120001R
Sample Location: GL95105$12
Sampled By: MLM
C.O.C. No.: 3994

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 7-11-06 Time: 0930 Method: ENCORE Monitor Reading (ppm):	0-1		Sandy silt, some clay

COMPOSITE SAMPLE DATA:

	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
CVOCs	3 5gram Encore	✓	
Moisture	2oz. Plastic	✓	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s): Mark L. Mingl

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name:	NAVAL STATION GREAT LAKES	Sample ID No.:	GL95105$12 0203R
Project No.:	112G00202 CTO 0009	Sample Location:	GL95105$12
		Sampled By:	MLM
		C.O.C. No.:	3794

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type: ______

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 7-11-06 Time: 0935 Method: ENCORE Monitor Reading (ppm):	2-3		SILTY CLAY, grey in color, stiff

COMPOSITE SAMPLE DATA:

	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
LVOCS	3 5-gram ENCORE	✓	
MOISTURE	2 oz PLASTIC	✓	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NAVAL STATION GREAT LAKES
Project No.: 112G00202 CTO 0009

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: NTC22SB150001 R
Sample Location: NTC22SB15
Sampled By: MLM
C.O.C. No.: 3794

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 7-11-06	0-1		SILTY CLAY, greenish grey soft
Time: 1010			
Method: ENCORE			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
CVOCS	3 5-gram ENCORES	✓	
MOISTURE	2 oz Plastic	✓	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): Mark L. Mengel

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NAVAL STATION GREAT LAKES
Project No.: 112G00202 CTO 0009

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: NTC22SB151112 R
Sample Location: NTC22SB15
Sampled By: MLM
C.O.C. No.: 3794

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 7-11-06	11-12		Clay, some silt and trace tiny pebbles grey
Time: 1020			
Method: ENCORE			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
CVOCs	3 5-GRAM ENCORES	✓	
MOISTURE	2 oz PLASTIC	✓	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s): Mark L. Mengel

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name:	NAVAL STATION GREAT LAKES	Sample ID No.:	NTC22SBMW10D0708R
Project No.:	112G00202 CTO 0009	Sample Location:	NTC22MW10D
		Sampled By:	MLM
		C.O.C. No.:	3794

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: ______
[] QA Sample Type: ______

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 7-11-06	7-8		SILTY CLAY, greyish trace pebbles
Time: 1050			
Method: ENCORE			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
CVOCS	3 5-gram ENCORE	✓	
MOISTURE	2 oz PLASTIC	✓	

OBSERVATIONS / NOTES:

COLLECTED DUPLICATE (NTC22FD01)

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.: NTC22FD01

Signature(s): Mark L. Mungal

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NAVAL STATION GREAT LAKES
Project No.: 112G00202 CTO 0009

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: NTC22MW10D1112 R 5B
Sample Location: NTC22MW10D
Sampled By: MLM
C.O.C. No.: 3794

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 7-11-06 Time: 1100 Method: ENCORE Monitor Reading (ppm):	11-12		SILTY CLAY , grey tight Stiff

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
CVOCS	3 5-GRAM ENCORE	✓	
MOISTURE	2oz PLASTIC	✓	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): Mark L. Morgel

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NAVAL STATION GREAT LAKES
Project No.: 112G00202 CTO 0009

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: NTC22MW06D0708R SB
Sample Location: NTC22MW06D
Sampled By: MLM
C.O.C. No.: 3794

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 7-11-06 Time: 1130 Method: ENCORE Monitor Reading (ppm):	7-8		SILTY CLAY, greenish grey STIFF

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
C VOCs	3 5-GRAM ENCORE	✓	
MOISTURE	2 oz PLASTIC	✓	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): Mark L. Mangel

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NAVAL STATION GREAT LAKES
Project No.: 112G00202 CTO 0009

[] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: ______
[] QA Sample Type: ______

Sample ID No.: NTC22SB220708R
Sample Location: NTC22SB22
Sampled By: MLM
C.O.C. No.: 3794

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 7-11-06 Time: 1215 Method: ENCORE Monitor Reading (ppm):	7-8		SILTY CLAY, WET, GREY

COMPOSITE SAMPLE DATA:

	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
CVOCs	3 5GRAM ENCORE	✓	
MOISTURE	2OZ PLASTIC	✓	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): Mark L. Mengel

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NAVAL STATION GREAT LAKES
Project No.: 112G00202 CTO 0009

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: NTC22SB221819 R
Sample Location: NTC22SB22
Sampled By: MLM
C.O.C. No.: 3794

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 7-11-06 Time: 1300 Method: ENCORE Monitor Reading (ppm):	18-19		SILTY CLAY, STIFF grey

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
C VOCs	3 5-gram Encore	✓	
moisture	2 oz plastic	✓	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): Mark L. Mengel

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NAVAL STATION GREAT LAKES
Project No.: 112G00202 CTO 0009

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: NTC22SB210910 R
Sample Location: NTC22SB21
Sampled By: MLM
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 7/12/06 Time: 0815 Method: ENCORE Monitor Reading (ppm):	9-10		SILTY CLAY, GREYISH GREEN, STIFF

COMPOSITE SAMPLE DATA:

	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
CVOCS	3 5-GRAM ENCORE		
MOISTURE	2 OZ PLASTIC		

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): Mark L Mingl

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NAVAL STATION GREAT LAKES
Project No.: 112G00202 CTO 0009

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: NTS22SB211314R
Sample Location: NTS22SB21
Sampled By: MLM
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 7-12-06 Time: 0820 Method: ENCORE Monitor Reading (ppm):	13-14		SILTY CLAY, greyish green STIFF

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
CVOCS	3 5-gram ENCORE	✓	
MOISTURE	2 oz PLASTIC	✓	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): Mark L Mengel

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NAVAL STATION GREAT LAKES
Project No.: 112G00202 CTO 0009

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: NTC22SB191920R
Sample Location: NTC22SB19
Sampled By: MLM
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 7-12-06 Time: 1105 Method: ENCORE Monitor Reading (ppm):	19-20		SILTY CLAY, GREY STIFF, MOIST

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
CVOCS	3 5GRAM ENCORE	✓	
MOISTURE	2OZ PLASTIC	✓	

OBSERVATIONS / NOTES:

collected duplicate (NTC22FD02)

PID readings in borehole > 400
PID readings of soil on augers after being pulled: 7-10 PPM.

Breathing Zone: < 1 PPM

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
	NTC22FD02

Signature(s): Mark L. Mengel

AUGUST 2006

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: Naval Station Great Lakes
Project No.: 112G00202 CTO 0009

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: NTC22SB200203R1
Sample Location: NTC22SB20
Sampled By: MLM
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8-7-06 Time: 1415 Method: Encore® Monitor Reading (ppm):	2.5-3.5	grey	fine ~~sandy~~ silty clay, trace sand.

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8/7/06				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Chlorinated VOCs	3 - 5 gram Encore®	✓	
Moisture	2 oz. plastic	✓	

OBSERVATIONS / NOTES:

OFFSET APPROXIMATELY 1' EAST of PRIOR LOCATION.

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name:	Naval Station Great Lakes	Sample ID No.:	NTC22SB151112R1
Project No.:	112G00202 CTO 0009	Sample Location:	NTC22SB15
		Sampled By:	MLM
		C.O.C. No.:	

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8-7-06 Time: 1505 Method: Encore® Monitor Reading (ppm):	11-12	grey	SILTY CLAY

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Chlorinated VOCs	3 - 5 gram Encore®	✓	
Moisture	2 oz. plastic	✓	

OBSERVATIONS / NOTES:

OFFSET APPROXIMATELY 1' WEST OF PRIOR LOCATION. GOT REFUSAL @ 3.5'. OFFSET TO SOUTHWEST.

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: Naval Station Great Lakes
Project No.: 112G00202 CTO 0009

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: NTC22SB210910R1
Sample Location: NTC22SB21
Sampled By: MLM
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8-7-06	9-10	brown	sand + silt
Time: 1620			
Method: Encore®			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Chlorinated VOCs	3 - 5 gram Encore®		
Moisture	2 oz. plastic		

OBSERVATIONS / NOTES:

minimal recovery.
Location was ≈ 1' ~~south~~ west of prior location

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: Naval Station Great Lakes
Project No.: 112G00202 CTO 0009

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: NTC22SB211314R1
Sample Location: NTC22SB21
Sampled By: MLM
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8-7-06 Time: 1630 Method: Encore® Monitor Reading (ppm):	13-14	gray	silty clay

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Chlorinated VOCs	3 - 5 gram Encore®	✓	
Moisture	2 oz. plastic	✓	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: Naval Station Great Lakes
Project No.: 112G00202 CTO 0009

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: NTC22SB191920R1
Sample Location: NTC22SB19
Sampled By: MLM
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8-9-06 Time: ~~[illegible]~~ 0850 Method: Encore® Monitor Reading (ppm):	19-20	GREY	SILTY CLAY, TRACE SAND

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Chlorinated VOCs	3 - 5 gram Encore®	✓	
Moisture	2 oz. plastic	✓	

OBSERVATIONS / NOTES:

Collected duplicate

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.: NTC22-FD01

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name:	Naval Station Great Lakes	Sample ID No.:	NTC22FD01
Project No.:	112G00202 CTO 0009	Sample Location:	NTC22FD
		Sampled By:	MLM
		C.O.C. No.:	

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[X] QA Sample Type: Field Duplicate

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8-8-06			
Time: 0000			
Method: Encore®			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Chlorinated VOCs	3 - 5 gram Encore®		
Moisture	2 oz. plastic		

OBSERVATIONS / NOTES:

DUPLICATE of NTC22SB19 1920 R1

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

SEPTEMBER 2006

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NAVAL STATION GREAT LAKES
Project No.: 112G00202 CTO 009

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: NTC22SB151112R3
Sample Location: NTC22SB15
Sampled By: MLM
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

		Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:	9/28/2006	11' - 12'		
Time:	1325			
Method:	ENCORE			
Monitor Reading (ppm):				

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
CVOCS	(3) 5-GRAM ENCORE	✓	
MOISTURE CONTENT	2 OZ. PLASTIC	✓	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NAVAL STATION GREAT LAKES
Project No.: 112G00202 CTO 009

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: NTC22MW10D1012R3
Sample Location: NTC22MW10D
Sampled By: MLM
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 9/28/2006	10' - 12'		
Time: 1410			
Method: ENCORE			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
CVOCS	(3) 5-GRAM ENCORE	✓	
MOISTURE CONTENT	2 OZ. PLASTIC	✓	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name:	NAVAL STATION GREAT LAKES	Sample ID No.:	NTC22SB221819R3
Project No.:	112G00202 CTO 009	Sample Location:	NTC22SB22
		Sampled By:	MLM
		C.O.C. No.:	

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: ___
[] QA Sample Type: ___

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

		Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:	9/28/2006	18' - 19'		
Time:	1445			
Method:	ENCORE			
Monitor Reading (ppm):				

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
CVOCS	(3) 5-GRAM ENCORE	✓	
MOISTURE CONTENT	2 OZ. PLASTIC	✓	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name:	NAVAL STATION GREAT LAKES	Sample ID No.:	NTC22SB200203R2
Project No.:	112G00202 CTO 009	Sample Location:	NTC22SB20
		Sampled By:	MLM
		C.O.C. No.:	308783

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

		Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:	9-12-06	2' - 3'		
Time:	0745			
Method:	ENCORE			
Monitor Reading (ppm):				

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
CVOCS	(3) 5-GRAM ENCORE	✓	
MOISTURE CONTENT	2 OZ. PLASTIC	✓	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): Mark L. Mengel

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NAVAL STATION GREAT LAKES
Project No.: 112G00202 CTO 009

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: NTC22SB200607R2
Sample Location: NTC22SB20
Sampled By: MLM
C.O.C. No.: 308783

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 9-12-06	6' - 7'		
Time: 0755			
Method: ENCORE			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
CVOCS	(3) 5-GRAM ENCORE	✓	
MOISTURE CONTENT	2 OZ. PLASTIC	✓	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): Mark L. Mengel

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NAVAL STATION GREAT LAKES
Project No.: 112G00202 CTO 009

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: NTCMW05S0001R2
Sample Location: NTCMW05S
Sampled By: MLM
C.O.C. No.: 308783

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

		Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:	9-12-06	0' - 1'		
Time:	0815			
Method:	ENCORE			
Monitor Reading (ppm):				

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
CVOCS	(3) 5-GRAM ENCORE	✓	
MOISTURE CONTENT	2 OZ. PLASTIC	✓	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): Mark L. Mengel

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name:	NAVAL STATION GREAT LAKES	Sample ID No.:	GL95105S120001R2
Project No.:	112G00202 CTO 009	Sample Location:	GL95105S12
		Sampled By:	MLM
		C.O.C. No.:	308783

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 9-12-06	0' - 1'		
Time: 0845			
Method: ENCORE			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
CVOCS	(3) 5-GRAM ENCORE	✓	
MOISTURE CONTENT	2 OZ. PLASTIC	✓	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): Mark L. Mengel

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name:	NAVAL STATION GREAT LAKES	Sample ID No.:	GL95105S120203R2
Project No.:	112G00202 CTO 009	Sample Location:	GL95105S12
		Sampled By:	MLM
		C.O.C. No.:	308783

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: ______
[] QA Sample Type: ______

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

		Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:	9-12-06	2' - 3'		
Time:	0850			
Method:	ENCORE			
Monitor Reading (ppm):				

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
CVOCS	(3) 5-GRAM ENCORE	✓	
MOISTURE CONTENT	2 OZ. PLASTIC	✓	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s): Mark L. Mengel

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name:	NAVAL STATION GREAT LAKES	Sample ID No.:	NTC22SB150001R2
Project No.:	112G00202 CTO 009	Sample Location:	NTC22SB15
		Sampled By:	MLM
		C.O.C. No.:	308783

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 9-12-06	0' - 1'		
Time: 0910			
Method: ENCORE			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
CVOCS	(3) 5-GRAM ENCORE	✓	
MOISTURE CONTENT	2 OZ. PLASTIC	✓	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): Mark L. Mengel

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name:	NAVAL STATION GREAT LAKES	Sample ID No.:	NTC22SB151112R2
Project No.:	112G00202 CTO 009	Sample Location:	NTC22SB15
		Sampled By:	MLM
		C.O.C. No.:	308783

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: ___
[] QA Sample Type: ___

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 9-12-06	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0925	11' - 12'		
Method: ENCORE			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
CVOCS	(3) 5-GRAM ENCORE	✓	
MOISTURE CONTENT	2 OZ. PLASTIC	✓	

OBSERVATIONS / NOTES:

D10 MS/MSD

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s): Mark L. Mengel

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NAVAL STATION GREAT LAKES
Project No.: 112G00202 CTO 009

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: NTC22MW10D0708R2
Sample Location: NTC22MW10D
Sampled By: MLM
C.O.C. No.: 308783

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

		Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:	9-12-06	7' - 8'		
Time:	1110			
Method:	ENCORE			
Monitor Reading (ppm):				

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
CVOCS	(3) 5-GRAM ENCORE	✓	
MOISTURE CONTENT	2 OZ. PLASTIC	✓	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s): Mark L. Mengel

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name:	NAVAL STATION GREAT LAKES	Sample ID No.:	NTC22MW10D1112R2
Project No.:	112G00202 CTO 009	Sample Location:	NTC22MW10D
		Sampled By:	MLM
		C.O.C. No.:	308783

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: ___
[] QA Sample Type: ___

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 9-12-06	11' - 12'		
Time: 1145			
Method: ENCORE			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
CVOCS	(3) 5-GRAM ENCORE	✓	
MOISTURE CONTENT	2 OZ. PLASTIC	✓	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): Mark L Mengel

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name:	NAVAL STATION GREAT LAKES	Sample ID No.:	NTC22MW06D0708R2
Project No.:	112G00202 CTO 009	Sample Location:	NTC22MW06D
		Sampled By:	MLM
		C.O.C. No.:	308783

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: ______
[] QA Sample Type: ______

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 9-12-06	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1020	7' - 8'		
Method: ENCORE			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
CVOCS	(3) 5-GRAM ENCORE	✓	
MOISTURE CONTENT	2 OZ. PLASTIC	✓	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
	NTC 22 FD 001

Signature(s): Mark L. Mengel

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name:	NAVAL STATION GREAT LAKES	Sample ID No.:	NTC22FD001
Project No.:	112G00202 CTO 009	Sample Location:	NTC22FD
		Sampled By:	MLM
		C.O.C. No.:	308783

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: ______
[] QA Sample Type: ______

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

		Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:	9-12-06			
Time:	0000			
Method:	ENCORE			
Monitor Reading (ppm):				

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
CVOCS	(3) 5-GRAM ENCORE	✓	
MOISTURE CONTENT	2 OZ. PLASTIC	✓	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.: NTC22MW06D0708R2

Signature(s): Mark L Mengel

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name:	NAVAL STATION GREAT LAKES	Sample ID No.:	NTC22SB210910R2
Project No.:	112G00202 CTO 009	Sample Location:	NTC22SB21
		Sampled By:	MLM
		C.O.C. No.:	307444

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: ______
[] QA Sample Type: ______

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 9-13-06	9' - 10'		
Time: 0740			
Method: ENCORE			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
CVOCS	(3) 5-GRAM ENCORE	✓	
MOISTURE CONTENT	2 OZ. PLASTIC	✓	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): Mark L. Mengel

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NAVAL STATION GREAT LAKES
Project No.: 112G00202 CTO 009

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: NTC22SB211314R2
Sample Location: NTC22SB21
Sampled By: MLM
C.O.C. No.: 307444

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 9-13-06	13' - 14'		
Time: 0750			
Method: ENCORE			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
CVOCS	(3) 5-GRAM ENCORE	✓	
MOISTURE CONTENT	2 OZ. PLASTIC	✓	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): Mark L Mengel

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name:	NAVAL STATION GREAT LAKES	Sample ID No.:	NTC22SB191920R2
Project No.:	112G00202 CTO 009	Sample Location:	NTC22SB19
		Sampled By:	MLM
		C.O.C. No.:	307444

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 9-13-06	19' - 20'		
Time: 1135			
Method: ENCORE			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
CVOCS	(3) 5-GRAM ENCORE	✓	
MOISTURE CONTENT	2 OZ. PLASTIC	✓	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:	Signature(s):
	NTC22FD002	Mark L. Mengel

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name:	NAVAL STATION GREAT LAKES	Sample ID No.:	NTC22SB220708R2
Project No.:	112G00202 CTO 009	Sample Location:	NTC22SB22
		Sampled By:	MLM
		C.O.C. No.:	307444

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: ______
[] QA Sample Type: ______

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 9-13-06	7' - 8'		
Time: 1000			
Method: ENCORE			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
CVOCS	(3) 5-GRAM ENCORE	✓	
MOISTURE CONTENT	2 OZ. PLASTIC	✓	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): Mark L. Mengel

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NAVAL STATION GREAT LAKES
Project No.: 112G00202 CTO 009

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: NTC22SB221819R2
Sample Location: NTC22SB22
Sampled By: MLM
C.O.C. No.: 307444

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 9-13-06	18' - 19'		
Time: 1025			
Method: ENCORE			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
CVOCS	(3) 5-GRAM ENCORE	✓	
MOISTURE CONTENT	2 OZ. PLASTIC	✓	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): Mark L. Mengel

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NAVAL STATION GREAT LAKES
Project No.: 112G00202 CTO 009

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: NTC22FD002
Sample Location: NTC22FD
Sampled By: MLM
C.O.C. No.: 302444

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 9-13-06			
Time: 0000			
Method: ENCORE			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
CVOCS	(3) 5-GRAM ENCORE	✓	
MOISTURE CONTENT	2 OZ. PLASTIC	✓	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.: NTC22SB191920R2

Signature(s): Mark L Mongel

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NAVAL STATION GREAT LAKES
Project No.: 112G00202 CTO 009

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: NTC22SB151112R3
Sample Location: NTC22SB15
Sampled By: MLM
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

		Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:	9/28/2006	11' - 12'		
Time:	1325			
Method:	ENCORE			
Monitor Reading (ppm):				

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
CVOCS	(3) 5-GRAM ENCORE	✓	
MOISTURE CONTENT	2 OZ. PLASTIC	✓	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name:	NAVAL STATION GREAT LAKES	Sample ID No.:	NTC22MW10D1012R3
Project No.:	112G00202 CTO 009	Sample Location:	NTC22MW10D
		Sampled By:	MLM
		C.O.C. No.:	

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: ______
[] QA Sample Type: ______

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

		Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:	9/28/2006	10' - 12'		
Time:	1410			
Method:	ENCORE			
Monitor Reading (ppm):				

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
CVOCS	(3) 5-GRAM ENCORE	✓	
MOISTURE CONTENT	2 OZ. PLASTIC	✓	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name:	NAVAL STATION GREAT LAKES	Sample ID No.:	NTC22SB221819R3
Project No.:	112G00202 CTO 009	Sample Location:	NTC22SB22
		Sampled By:	MLM
		C.O.C. No.:	

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: ______
[] QA Sample Type: ______

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

		Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:	9/28/2006	18' - 19'		
Time:	1445			
Method:	ENCORE			
Monitor Reading (ppm):				

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
CVOCS	(3) 5-GRAM ENCORE	✓	
MOISTURE CONTENT	2 OZ. PLASTIC	✓	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

MARCH 2007

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NAVAL STATION GREAT LAKES
PROJECT NUMBER: 112G00202
DRILLING COMPANY: TTL
DRILLING RIG:

BORING No.: NTC22SB 20 R
DATE: 3-6-07
GEOLOGIST: MLM
DRILLER: CHRIS WHITE

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
							8 1/4 HSA 0-30'						
							REFER TO boring						
							log for SB20						
							(10/21-22/03)						
	5						for complete soil			0		0	
							description						
						GR	clay @ 7						
	10					GR	CLAY		CUTTINGS	1		0	
	15					GR	CLAY		CUTTINGS	1		0	
						GR							
	20								CUTTINGS	2		0	
				▽	WET	GR	WATER / CLAY						
	25												

* When rock coring, enter rock brokeness.
** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes ✓ No ____ Well I.D. #: MW10D R

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NAVAL STATION GREAT LAKES
PROJECT NUMBER: 112G00202
DRILLING COMPANY: TTL
DRILLING RIG:

BORING No.: NTC22SB 20 R
DATE: 3-6-07
GEOLOGIST: MLM
DRILLER: CHRIS WHITE

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	30					GR	CLAY		8 1/4 HSA 0-30'				
							SAND + SILT						
	35					LT	FINE SAND						
	40						FINE SAND		3 1/4" HSA 30-40'				
							40' BOTTOM						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: ____________________

Drilling Area Background (ppm): ______

Converted to Well: Yes ______ No ______ Well I.D. #: ______________

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NAVAL STATION GREAT LAKES
PROJECT NUMBER: 112G00202
DRILLING COMPANY: TTL
DRILLING RIG:

BORING No.: NTC22SB06 R
DATE:
GEOLOGIST: MLM
DRILLER: CHRIS WHITE

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
							See original boring						
	5						log for SB06 for			0		0	
							details.						
						GR	clay @ 7'						
	10					GR	CLAY / SILT			0		1	
	15					GR	CLAY / SILT			0		1	
	20					GR	CLAY / SILT.			1		1	
							24' bottom						
	25						bottom @ 25'						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: 4 1/4" HSA

Drilling Area Background (ppm):

Converted to Well: Yes ______ No ______ Well I.D. #: ______

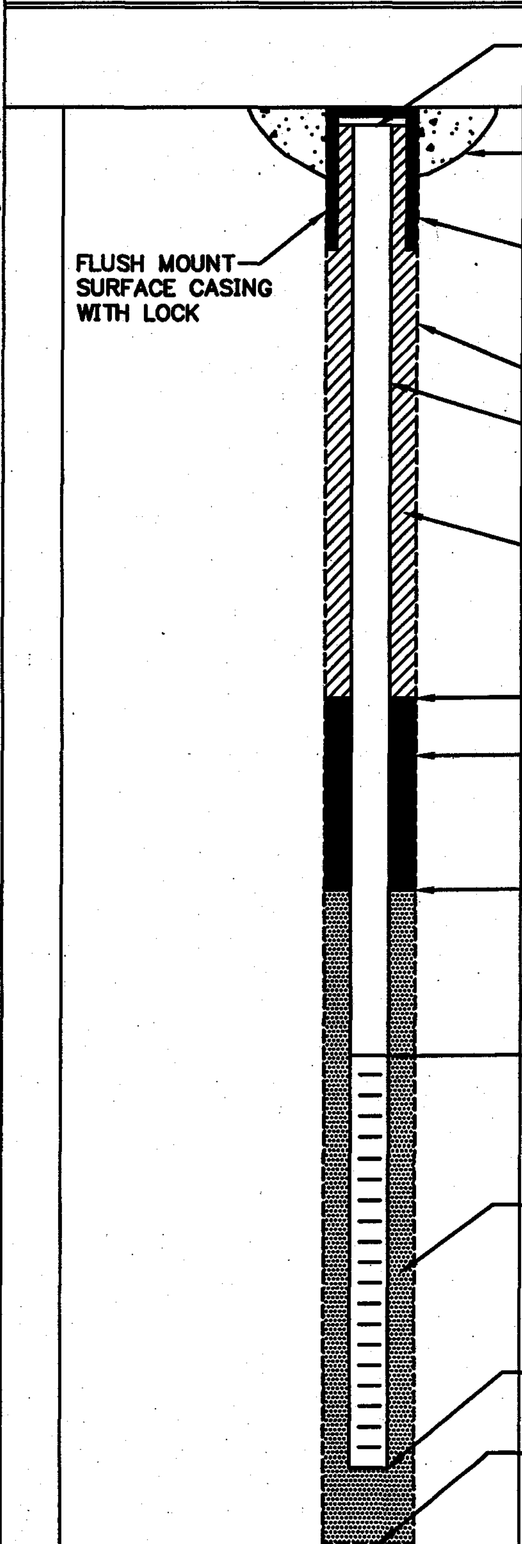
WELL NO.: MW06SR

Tetra Tech NUS, Inc.

OVERBURDEN MONITORING WELL SHEET FLUSH - MOUNT

PROJECT NTC GREAT LAKES	LOCATION SITE 22	DRILLER TTL (Chris White)
PROJECT NO. 112G00202	BORING SB06R	DRILLING METHOD HSA
DATE BEGUN 3-6-07	DATE COMPLETED 3-	DEVELOPMENT METHOD
FIELD GEOLOGIST MLM		
GROUND ELEVATION	DATUM	

ACAD:FORM_MWFM.dwg 07/20/99 INL



ELEVATION TOP OF RISER:

TYPE OF SURFACE SEAL: cement

TYPE OF PROTECTIVE CASING: FLUSH MOUNT

I.D. OF PROTECTIVE CASING: 8"

DIAMETER OF HOLE: 4 1/4 HSA

TYPE OF RISER PIPE: 2" PVC

RISER PIPE I.D.: 2"

TYPE OF BACKFILL/SEAL: Cement Grout

ELEVATION/DEPTH TOP OF SEAL: / 11

TYPE OF SEAL: Bentonite

ELEVATION/DEPTH TOP OF SAND: / 13

ELEVATION/DEPTH TOP OF SCREEN: / 15

TYPE OF SCREEN: 10 slot

SLOT SIZE x LENGTH: 10 x 10'

TYPE OF SAND PACK:

DIAMETER OF HOLE IN BEDROCK:

ELEVATION / DEPTH BOTTOM OF SCREEN: / 25

ELEVATION / DEPTH BOTTOM OF SAND: /

ELEVATION/DEPTH BOTTOM OF HOLE: / 25

BACKFILL MATERIAL BELOW SAND:

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NAVAL STATION GREAT LAKES
PROJECT NUMBER: 112G00202
DRILLING COMPANY: TTL
DRILLING RIG:
BORING No.: NTC22SB 10$R
DATE: 3-7-07
GEOLOGIST: MLM
DRILLER: CHRIS WHITE

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
							see original						
							boring log for 10$						
							for details						
	5												
							CLAY, SILT						
	10												
									▽ ≈ 12'				
				▽									
	15						CLAY, SILT						
	20						CLAY, SILT						
	25						CLAY, SILT						

* When rock coring, enter rock brokeness.
** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: 8¼" HSA to 30'; 3¼" HSA to 35'

Drilling Area Background (ppm):

Converted to Well: Yes ✓ No ____ Well I.D. #:

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NAVAL STATION GREAT LAKES
BORING No.: NTC22SB105 R
PROJECT NUMBER: 112G00202
DATE:
DRILLING COMPANY: TTL
GEOLOGIST: MLM
DRILLING RIG:
DRILLER: CHRIS WHITE

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
									8 1/4 HSA TO 30'				
	30												
							SAND, SILT						
	35												
							BOTTOM @ 35'						

* When rock coring, enter rock brokeness.
** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

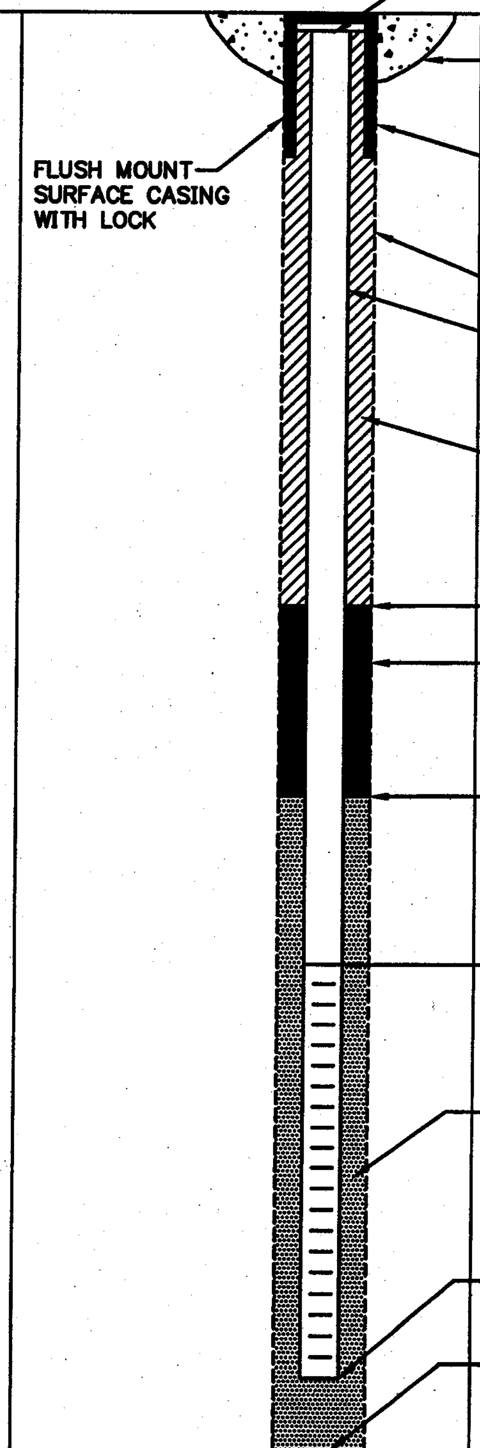
Converted to Well: Yes ______ No ______ Well I.D. #: ______

WELL NO.: MW108 R

Tetra Tech NUS, Inc.

OVERBURDEN MONITORING WELL SHEET FLUSH - MOUNT

PROJECT: NTC 22	LOCATION:	DRILLER: TTL
PROJECT NO.: 112600202	BORING:	DRILLING METHOD:
DATE BEGUN: 3-7-07	DATE COMPLETED: 3-7-07	DEVELOPMENT METHOD:
FIELD GEOLOGIST: MLM		
GROUND ELEVATION:	DATUM:	



ELEVATION TOP OF RISER:

TYPE OF SURFACE SEAL: Cement

TYPE OF PROTECTIVE CASING: Flush Mount

I.D. OF PROTECTIVE CASING: 8"

DIAMETER OF HOLE: 8¼" to 30', 3¼ to 35'

TYPE OF RISER PIPE: 2" PVC

RISER PIPE I.D.: 2"

TYPE OF BACKFILL/SEAL: Cement / bentonite grout

ELEVATION/DEPTH TOP OF SEAL: / 28

TYPE OF SEAL: Bentonite

ELEVATION/DEPTH TOP OF SAND: / 30

ELEVATION/DEPTH TOP OF SCREEN: / 33

TYPE OF SCREEN: 10 slot

SLOT SIZE x LENGTH: 10 x 2'

TYPE OF SAND PACK:

DIAMETER OF HOLE IN BEDROCK:

ELEVATION / DEPTH BOTTOM OF SCREEN: / 35

ELEVATION / DEPTH BOTTOM OF SAND: /

ELEVATION/DEPTH BOTTOM OF HOLE: / 35

BACKFILL MATERIAL BELOW SAND:

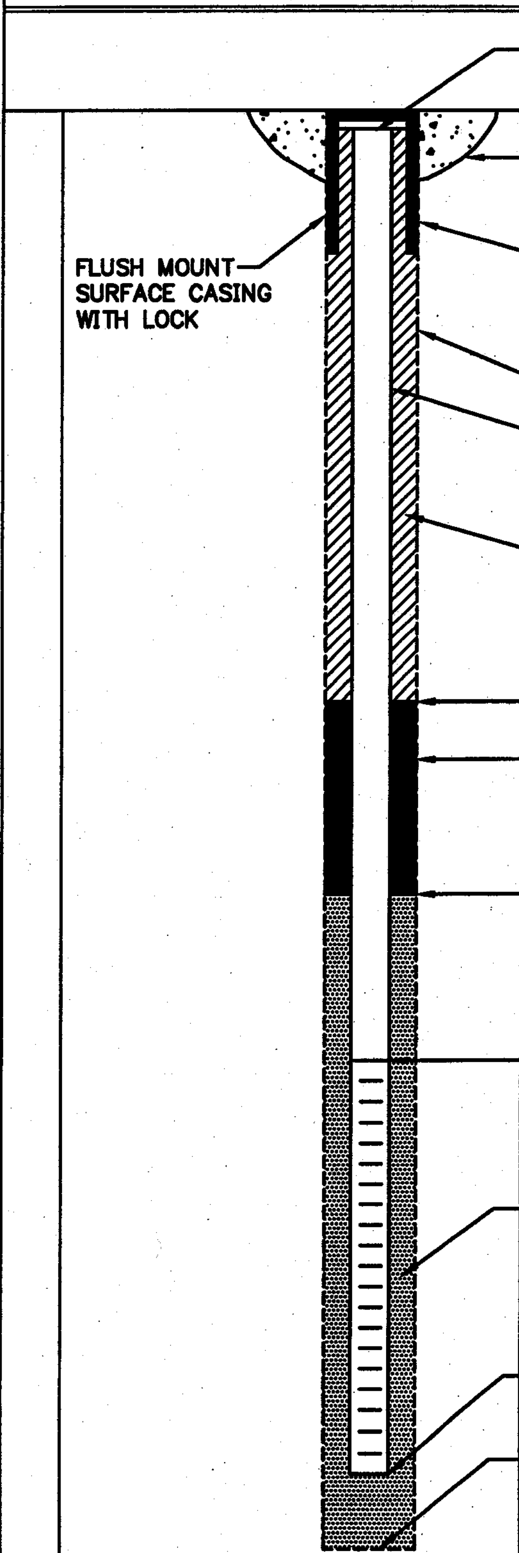
ACAD:FORM_MWFM.dwg 07/28/99 INL

WELL NO.: MW10D R

Tetra Tech NUS, Inc.

OVERBURDEN
MONITORING WELL SHEET
FLUSH - MOUNT

PROJECT NTC GREAT LAKES	LOCATION NTC 22 MW10D R	DRILLER TTL
PROJECT NO. 112600202	BORING SB20 R	DRILLING METHOD HSA
DATE BEGUN 3-6-07	DATE COMPLETED	
FIELD GEOLOGIST MLM		DEVELOPMENT METHOD
GROUND ELEVATION	DATUM	



ELEVATION TOP OF RISER:

TYPE OF SURFACE SEAL: cement

TYPE OF PROTECTIVE CASING: FLUSH MOUNT

I.D. OF PROTECTIVE CASING: 8"

DIAMETER OF HOLE: 8 1/4" to 30', 3 1/4 - 30-40

TYPE OF RISER PIPE: 2" PVC

RISER PIPE I.D.: 2"

TYPE OF BACKFILL/SEAL: Cement GROUT

ELEVATION/DEPTH TOP OF SEAL: / 33

TYPE OF SEAL: Bentonite

ELEVATION/DEPTH TOP OF SAND: / 35

ELEVATION/DEPTH TOP OF SCREEN: / 37

TYPE OF SCREEN: 10 slot

SLOT SIZE x LENGTH: 10 x 3'

TYPE OF SAND PACK:

DIAMETER OF HOLE IN BEDROCK:

ELEVATION / DEPTH BOTTOM OF SCREEN: / 40

ELEVATION / DEPTH BOTTOM OF SAND: /

ELEVATION/DEPTH BOTTOM OF HOLE: /

BACKFILL MATERIAL BELOW SAND:

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: MW100 R
Site: 22
Date Installed: 3-6-07
Date Developed: 3-8-07
Dev. Method: electric pump
Pump Type:

Depth to Bottom (ft.): 40'
Static Water Level Before (ft.): 4.10
Static Water Level After (ft.):
Screen Length (ft.): 3'
Specific Capacity:
Casing ID (in.): 2"

Responsible Personnel:
Drilling Co.: TTL
Project Name: SITE 22
Project Number: 112600202

Time	Estimated Sediment Thickness (Ft.)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units ____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1445			4.10	24.73	7.88	.647	—	
1450			16.70	24.80	7.93	.652	—	
1455			16.20	31.22	7.57	.629	—	
1500			16.80	31.50	7.54	.624	550	
1505			16.65	31.30	7.56	.627	550	
1510			16.80	31.70	7.52	.628	550	
1515			16.70	29.35	7.54	.633	600	

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: MW 65 R
Site: 22
Date Installed: 3-7-07
Date Developed: 3-8-07
Dev. Method: electric pump
Pump Type:

Depth to Bottom (ft.): 24.6
Static Water Level Before (ft.): 5.20
Static Water Level After (ft.):
Screen Length (ft.): 10'
Specific Capacity:
Casing ID (in.): 2"

Responsible Personnel:
Drilling Co.: TTL
Project Name: NTC Site 22
Project Number: 112600202

Time	Estimated Sediment Thickness (Ft.)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units ____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1350			Purged dry	37.0	7.11	.670	228	
			18.00				—	Purged dry twice
								WATER

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: MW10* R
Site: 22
Date Installed: 3-7-07
Date Developed: 3-8-07
Dev. Method: electric Pump
Pump Type:

Depth to Bottom (ft.): 35
Static Water Level Before (ft.): 5.47
Static Water Level After (ft.):
Screen Length (ft.): 2'
Specific Capacity:
Casing ID (in.): 2"

Responsible Personnel:
Drilling Co.: TTL
Project Name: Site 22
Project Number: 112600202

Time	Estimated Sediment Thickness (Ft.)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units ____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1400			5.47	36.0	8.48	.596	154	
1410			14.30	37.3	7.94	.562	—	
1415			14.30	31.40	7.82	.590	—	
1420			14.30	33.40	7.21	.585	900	
1425			14.30	32.90	7.72	.590	550	
1430			14.30	32.93	7.78	.580	550	
		90 gal	purged					stopped

Tetra Tech NUS, Inc.

GROUNDWATER LEVEL MEASUREMENT SHEET

Project Name: NAVAL STATION GREAT LAKES
Project No.: 0202 CTO 0009
Location: SITE 22
Personnel:
Weather Conditions: SUNNY 40°
Measuring Device: M-Scope
Tidally Influenced: Yes ___ No ___
Remarks:

Well or Piezometer Number	Date	Time	Elevation of Reference Point (feet)*	Total Well Depth (feet)*	Water Level Indicator Reading (feet)*	Groundwater Elevation (feet)*	Comments
NTC22MW01S	3-11-07	1458		32	2.51		
NTC22MW02S		1505		20	5.85		
NTC22MW03S		1457		24	5.24		
NTC22MW04S		1510		24	3.71		
NTC22MW05S	ABANDONED						
NTC22MW06S	ABANDONED			25'	24.05		
NTC22MW07S		1452		[illegible]		submerged	
NTC22MW08S		1501		24	4.83		
NTC22MW09S				[illegible]		Frozen	
NTC22MW10S	ABANDONED			35	4.20		
		1453					
NTC22MW06D	ABANDONED						
NTC22MW07D		1503			4.85		
NTC22MW10D	ABANDONED			40	4.05		
		1455					

* All measurements to the nearest 0.01 foot

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NAVAL STATION GREAT LAKES
Project No.: 112G00202

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: NTC22MW06$ R
Sample Location: NTC22MW 06$
Sampled By: MLM
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA: //

	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	~~Other~~
Date: 3-~~10~~-07								
Time: 1315	(Visual)	(S.U.)	(mS/cm)	(°C)	(NTU)	(mg/l)	(%)	ORP
Method: Low -Flow		8.02	1.30	41.90		0.81		-19

PURGE DATA:

	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Date:								
Method: Peristaltic Pump								
Monitor Reading (ppm):								
Well Casing Diameter & Material								
Type: 2-inch PVC								
Total Well Depth (TD):								
Static Water Level (WL):								
One Casing Volume(gal/L):								
Start Purge (hrs):								
End Purge (hrs):								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
VOCs	HCL	3 40-ml VOA VIALS	✓

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): Mark L. Mengel

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NAVAL STATION GREAT LAKES
PROJECT NUMBER: 112G00202
WELL ID.: NTC22MW 06 $ R
DATE: 3-10-07

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	ORP mV	Salinity % or ppt	Comments
0800	22.20	250	7.94	1.37	50	0.00	41.42	61		
0810		250	8.18	1.48	700	0.35	42.90	38		
0820		250	8.02	1.32	750	0.81	41.90	-19		well is dry

NOTES: WAS ONLY APPROXIMATELY 3' of WATER in well. WATER WAS NOT TURBID to start but fines in bottom created turbidity At end of purge. Will try to Purge Additional later. Used purge H_2O to send to Georgia Tech.

SIGNATURE(S): Mark A. Mengel

PAGE 2 OF 2

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name:	NAVAL STATION GREAT LAKES	Sample ID No.:	NTC22MW0105R
Project No.:	112G00202	Sample Location:	NTC22MW0105
		Sampled By:	MLM
[] Domestic Well Data		C.O.C. No.:	
[X] Monitoring Well Data		Type of Sample:	
[] Other Well Type:		[X] Low Concentration	
[] QA Sample Type:		[] High Concentration	

SAMPLING DATA:

	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (^0C)	Turbidity (NTU)	DO (mg/l)	Salinity (%)	~~Other~~ ORP
Date: 3-10-07								
Time: 1000								
Method: Low-Flow ✓	clear	7.39	.596	39.27	6.5	0.0		-172

PURGE DATA:

	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Date: 3-10-07								
Method: Peristaltic Pump								
Monitor Reading (ppm):								
Well Casing Diameter & Material								
Type: 2-inch PVC								
Total Well Depth (TD): 35'								
Static Water Level (WL): 4.22								
One Casing Volume(gal/L):								
Start Purge (hrs): 0845								
End Purge (hrs): 0955								
Total Purge Time (min): 70								
Total Vol. Purged (gal/L): 5 Gal								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
VOCs	HCL	3 40-ml VOA VIALS	✓

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD	Duplicate ID No.:	Signature(s):
		Mark L. Mengel

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NAVAL STATION GREAT LAKES
PROJECT NUMBER: 112G00202

WELL ID.: NTC22MW010 $ R
DATE: 3-10-07

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	ORP mV	Salinity % or ppt	Comments
0845	4.22	280	7.55	.615	80	.89	38.41	-103		
0855	4.50	280	7.64	.619	55	0.0	39.36	-135		
0905	4.50	280	7.52	.617	65	0.0	38.68	-168		
0915	4.51	280	7.45	.616	19	0.0	38.36	-171		
0925	4.51	280	7.41	.610	9.4	0.0	38.40	-171		
0935	4.52	280	7.39	.603	5.6	0.0	38.61	-170		
0945	4.52	280	7.37	.602	5.2	0.0	38.94	-171		
0955	4.52	280	7.39	.596	6.5	0.0	39.27	-172		
			END	PURGE						

SIGNATURE(S): Mark L Mengel

PAGE 1 OF 2

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name:	NAVAL STATION GREAT LAKES	Sample ID No.:	NTC22MW0100R
Project No.:	112G00202	Sample Location:	NTC22MW0100
		Sampled By:	MLM
[] Domestic Well Data		C.O.C. No.:	
[X] Monitoring Well Data		Type of Sample:	
[] Other Well Type:		[X] Low Concentration	
[] QA Sample Type:		[] High Concentration	

SAMPLING DATA:

	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (^{0}C)	Turbidity (NTU)	DO (mg/l)	Salinity (%)	~~Other~~ ORP
Date: 3-10-07								
Time: 1245								
Method: Low -Flow	Clear	7.43	.656	38.02	7.4	0.32		-182

PURGE DATA:

	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Date: 3-10-07								
Method: Peristaltic Pump								
Monitor Reading (ppm):								
Well Casing Diameter & Material								
Type: 2-inch PVC								
Total Well Depth (TD): 40'								
Static Water Level (WL): 4.10								
One Casing Volume(gal/L):								
Start Purge (hrs): 1125								
End Purge (hrs): 1225								
Total Purge Time (min): 60								
Total Vol. Purged (gal/L): 5 g								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
VOCs	HCL	3 40-ml VOA VIALS	✓

OBSERVATIONS / NOTES:

Circle If Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): Mark L. Mengel

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NAVAL STATION GREAT LAKES
PROJECT NUMBER: 112G00202
WELL ID.: NTC22MW010DR
DATE: 3-10-07

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	ORP mV	Salinity % or ppt	Comments
1125	4.10	250	7.78	.689	31	1.69	39.35	-146		
1135	4.50	250	7.73	.671	19	0.74	39.35	-182		
1145	4.50	250	7.55	.670	31	0.40	38.75	-185		
1155	4.50	250	7.55	.660	17	0.37	38.52	-185		
1205	4.50	250	7.46	.650	9.2	0.29	38.42	-186		
1215	4.50	250	7.44	.660	7.9	0.28	38.18	-184		
1225	4.50	250	7.43	.656	7.4	0.32	38.02	-182		
				END	PURGE					

SIGNATURE(S): Mark L. Mengel

PAGE 2 OF 2

Tetra Tech NUS, Inc.

PROJECT NAME : NAVAL STATION GREAT LAKES

SITE NAME: NTC22

PROJECT No.: 112G00202

INSTRUMENT NAME/MODEL: LAMOTTE 2020

MANUFACTURER: LAMOTTE

SERIAL NUMBER: 10420599

Date of Calibration	Person Performing Calibration		pH	S.C	Turbidity	D.O.	Temperature	Salinity	ORP	Calibration Standard	Remarks
(mm/dy/yr)	(Name)		(S.U.)	(S/cm)	(NTUs)	(mg/L)	°C	(%)	(mV)	Lot # & Expiration Date	
3-8-07	MLM	Pre			11					Lot # 1404402	
		Post			10.79					Exp. Date:	
3-10-07	MLM	Pre			9.10					Lot #	
		Post			10.00					Exp. Date:	
		Pre								Lot #	
		Post								Exp. Date:	
		Pre								Lot #	
		Post								Exp. Date:	
		Pre								Lot #	
		Post								Exp. Date:	
		Pre								Lot #	
		Post								Exp. Date:	
		Pre								Lot #	
		Post								Exp. Date:	
		Pre								Lot #	
		Post								Exp. Date:	
		Pre								Lot #	
		Post								Exp. Date:	
		Pre								Lot #	
		Post								Exp. Date:	
		Pre								Lot #	
		Post								Exp. Date:	
		Pre								Lot #	
		Post								Exp. Date:	

Tetra Tech NUS, Inc.

PROJECT NAME : NAVAL STATION GREAT LAKES

SITE NAME: NTC22

PROJECT No.: 112G00202

INSTRUMENT NAME/MODEL: Horiba U-22 Water Quality Meter

MANUFACTURER: Horiba

SERIAL NUMBER: 00010003 LOT # 2604301

Date of Calibration	Person Performing Calibration		pH	S.C	Turbidity	D.O.	Temperature	Salinity	ORP	Calibration Standard	Remarks
(mn/dy/yr)	(Name)		(S.U.)	(S/cm)	(NTUs)	(mg/L)	°C	(%)	(mV)	Lot # & Expiration Date	
3/8/07	MLM	Pre	3.95	99.9	0	8.13	18.63		237	Lot # 5350	
		Post	4.00	4.59	0	9.18	17.70		246	Exp. Date: 7-07	
3/10/07	MLM	Pre	4.05	4.47		10.75	6.92		282	Lot #	
		Post	4.00	4.59		11.17	6.91		282	Exp. Date:	
		Pre								Lot #	
		Post								Exp. Date:	
		Pre								Lot #	
		Post								Exp. Date:	
		Pre								Lot #	
		Post								Exp. Date:	
		Pre								Lot #	
		Post								Exp. Date:	
		Pre								Lot #	
		Post								Exp. Date:	
		Pre								Lot #	
		Post								Exp. Date:	
		Pre								Lot #	
		Post								Exp. Date:	
		Pre								Lot #	
		Post								Exp. Date:	
		Pre								Lot #	
		Post								Exp. Date:	
		Pre								Lot #	
		Post								Exp. Date:	

Tetra Tech NUS, Inc.

PROJECT NAME : NAVAL STATION GREAT LAKES

SITE NAME: NTC22

PROJECT No.: 112G00202

INSTRUMENT NAME/MODEL:

MANUFACTURER:

SERIAL NUMBER:

Date of Calibration (mm/dy/yr)	Person Performing Calibration (Name)		pH (S.U.)	~~S.C~~ PPM (S/cm)	Turbidity (NTUs)	D.O. (mg/L)	Temperature °C	Salinity (%)	ORP (mV)	Calibration Standard Lot # & Expiration Date	Remarks
3/6/07	MINI-RAY 2000	Pre		98						Lot #	100PPM CAL GAS
		Post		100						Exp. Date:	
		Pre								Lot #	
		Post								Exp. Date:	
		Pre								Lot #	
		Post								Exp. Date:	
		Pre								Lot #	
		Post								Exp. Date:	
		Pre								Lot #	
		Post								Exp. Date:	
		Pre								Lot #	
		Post								Exp. Date:	
		Pre								Lot #	
		Post								Exp. Date:	
		Pre								Lot #	
		Post								Exp. Date:	
		Pre								Lot #	
		Post								Exp. Date:	
		Pre								Lot #	
		Post								Exp. Date:	
		Pre								Lot #	
		Post								Exp. Date:	
		Pre								Lot #	
		Post								Exp. Date:	

APPENDIX E

SURVEY DATA

James Anderson Company Point No.	Monitoring well ID and/or Description	Northing (NAD 83 US feet)	Easting (NAD 83 US feet)	Elevation of top of well casing (NAVD 88 US feet)	Existing ground or concrete elevation adjacent to well (NAVD 88 US feet)
204	22MW01 NEW	2057372.29	1117751.21	648.93	649.30
205	22MW02 NEW	2057366.52	1117751.74	649.06	649.31
206	22MW03 NEW	2057360.98	1117752.51	649.03	649.30
203	NTC22MW03S	2057409.39	1117732.22	648.74	649.00
201	NTC22MW04S	2057379.50	1117673.21	648.36	648.82
202	NTC22MW08S	2057340.25	1117661.96	648.46	648.84
Note: Elevations shown hereon were obtained using a level.					

James Anderson Company Point No.	Monitoring well ID and/or Description	Northing (NAD 83 US feet)	Easting (NAD 83 US feet)	Elevation of top of well lid (NAVD 88 US feet)	Existing pavement or concrete elevation at abandoned well location (NAVD 88 US feet)
285	NTC22MW01S	2057514.92	1117634.75	648.43	
286	NTC22MW02S	2057458.78	1117831.93	650.08	
287	NTC22MW05S ABANDONED	2057358.40	1117718.49		649.13
288	NTC22MW07D	2057342.19	1117811.69	649.89	
289	NTC22MW07S	2057353.76	1117811.91	649.58	
282	NTC22MW09S	2057304.18	1117751.45	649.29	
290	NTC22MW10D ABANDONED	2057375.64	1117751.83		649.28
291	NTC22MW10S ABANDONED	2057369.04	1117751.78		649.43
207	MW ABANDONED	2057346.74	1117762.75		649.83
208	MW ABANDONED	2057358.90	1117762.54		649.76
209	MW ABANDONED	2057365.25	1117762.53		649.76
210	MW ABANDONED	2057371.69	1117762.19		649.75
211	MW ABANDONED	2057379.97	1117763.45		649.73
212	MW ABANDONED	2057387.13	1117763.85		649.62
213	MW ABANDONED	2057380.70	1117778.41		649.09
214	MW ABANDONED	2057372.38	1117774.93		649.33
215	MW ABANDONED	2057364.52	1117778.46		649.15
216	MW ABANDONED	2057353.06	1117747.48		649.45
217	MW ABANDONED	2057366.05	1117747.45		649.44
218	MW ABANDONED	2057373.42	1117745.82		649.35
219	MW ABANDONED	2057377.18	1117745.09		649.26
220	MW ABANDONED	2057373.30	1117735.24		649.24
221	MW ABANDONED	2057366.92	1117739.44		649.29
222	MW ABANDONED	2057359.95	1117734.96		649.37
223	MW ABANDONED	2057346.25	1117734.92		649.40
224	MW ABANDONED	2057352.79	1117721.32		649.26
225	MW ABANDONED	2057366.91	1117720.90		649.15
226	MW ABANDONED	2057359.65	1117713.81		649.15
227	MW ABANDONED	2057359.27	1117707.00		649.09
228	MW ABANDONED	2057356.94	1117700.53		649.09
229	MW ABANDONED	2057353.04	1117695.27		649.07
Note: Elevations shown hereon were obtained using GPS.					

STA	+	⊼	−	EL
BM-2	3.835	652.685		648.85
	6.24	654.445	4.48	648.205
TOP OF LID GRD MW04S			5.625	648.82
22MW04S	5.58	653.935	6.09	648.355
GRD MW08S			5.10	648.835
22MW08S	5.405	653.865	5.475	648.46
GRD MW03S			4.87	648.995
22MW03S	5.45	654.185	5.13	648.735
GRD MW01 NEW			4.88	649.305
22MW01 NEW	5.415	654.34	5.26	648.925
GRD MW02 NEW			5.03	649.31
22 MW02 NEW	5.195	654.255	5.28	649.06
GRD MW03 NEW			4.95	649.305
22 MW03 NEW	5.06	654.085	5.23	649.025
	4.535	652.74	5.88	648.205
BM-2			3.895	648.845 (−0.005)

March 12, 2007

I.T. VANKOV
C.T. MILLER

⊼ @ AJ 2876 SL. HT = 5.66

200 - CHK AJ 2875 (HD = 0.046)
200 - 337 (CHK AJ 2875 HD = 0.01)

March 13, 2007

I.T. VANKOV
C.T. MILLER

PEG TEST "TOPCON" LEVEL

STA	+	−	ΔEL
ROD	1.925		− 3.630
BM-1	4.115	5.555	+ 3.645
ROD		0.47	0.015

STA	+	⊼	−	EL
BM-1	4.17	693.66		689.49
SEE E688 P. 16R				
MW 05	2.335	691.70	4.295	689.365
BM-109	3.02	688.775	5.945	685.755
SEE M35 P. 31R				
MW 06	1.645	685.36	5.06	683.715

field sketch

for

location of 3 monitoring wells at Site 22 at Great Lakes Naval Training Station

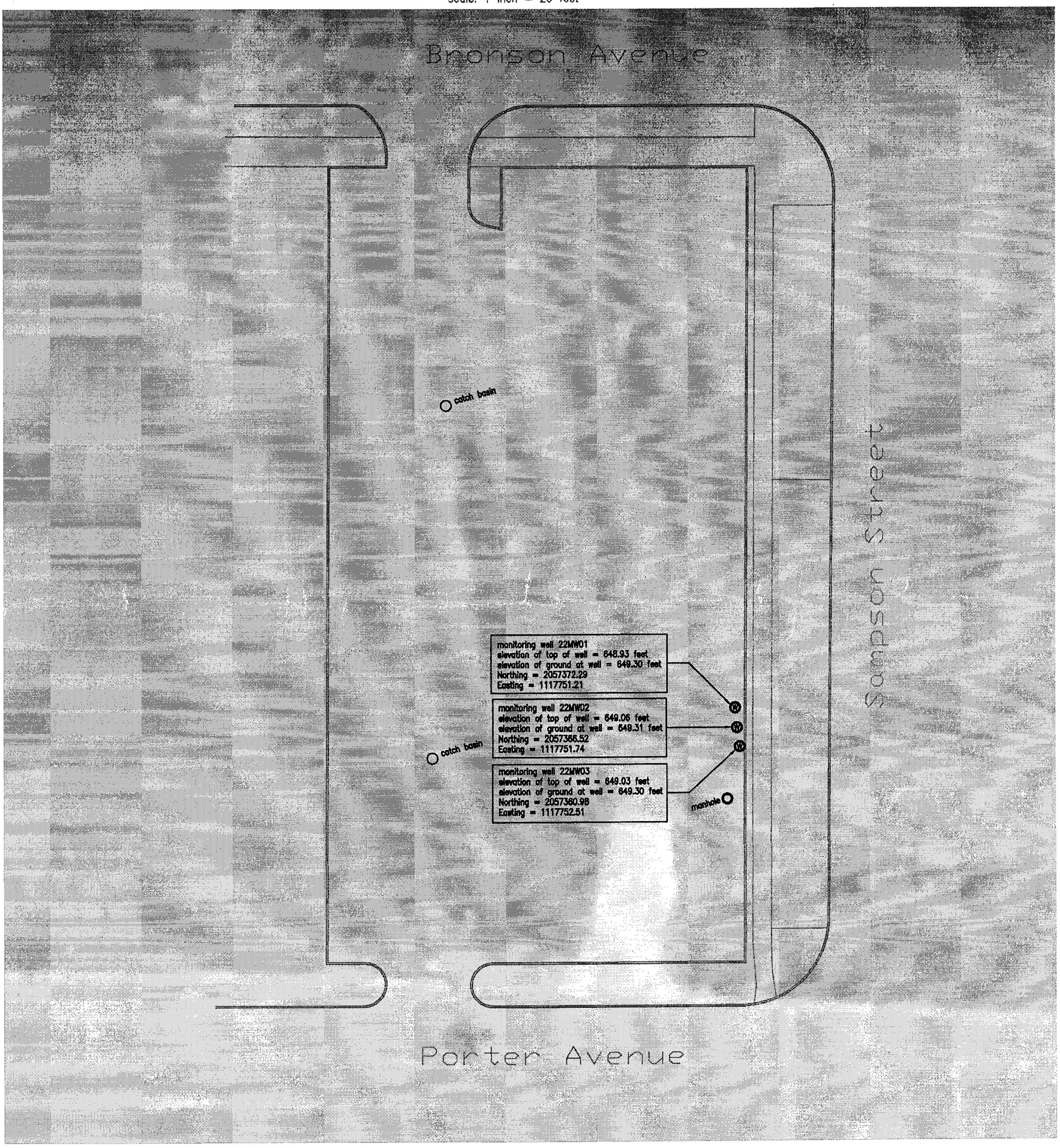
GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

All dimensions hereon shown unless it is otherwise noted are given in feet and decimal parts thereof.

scale: 1 inch = 20 feet



for	FROM THE OFFICE OF	
Tetra Tech NUS, Inc. 661 Andersen Drive Pittsburgh, Pennsylvania 15220	JAMES ANDERSON COMPANY ENGINEERS, PLANNERS, AND SURVEYORS 920 WEST NORTH SHORE DRIVE LAKE BLUFF, ILLINOIS, 60044 847-295-3322	Order No. 16935 Field Book E697 page 27 Date March 30, 2007 File No. none

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APPENDIX F

LABORATORY ANALYTICAL DATA, CHAIN OF CUSTODY RECORDS, AND VALIDATION INFORMATION

NOVEMBER 2005

Tetra Tech NUS

INTERNAL CORRESPONDENCE

TO:	**B. DAVIS**	**DATE:**	**JANUARY 20, 2006**
FROM:	**EDWARD SEDLMYER**	**COPIES:**	**DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION- VOA**
CTO 0009, NTC GREAT LAKES
SDG 5K18318

SAMPLES: 7/Aqueous

NTC22FD03	NTC22MW05S02	NTC22MW06S02
NTC22MW10D02	NTC22MW10S02	NTC22TB01
NTC22TB02		

16/Solid

NTC22SB200203	NTC22SB200506	NTC22SB210203
NTC22SB210405	NTC22SB211112	NTC22SB220203
NTC22SB220708	NTC22SB221112	NTC22SB230102
NTC22SB230203	NTC22SB240102	NTC22SB240203
NTC22SB250102	NTC22SB250203	NTC22FD01
NTC22FD02		

OVERVIEW

The sample set for CTO 0009 NTC Great Lakes, SDG 5K18318 consists of two (2) trip blanks, five (5) aqueous environmental samples, and sixteen (16) solid environmental samples. The samples were analyzed for select chlorinated volatile organic compounds (VOCs). Three field duplicate pairs were included in this SDG: NTC22SB210405/NTC22FD01, NTC22SB221112/NTC22FD02, and NTC22MW06S02/NTC22FD03.

The samples were collected by TetraTech NUS on November 17 and 20, 2005 and analyzed by STL Laboratories Laboratories. All analyses were conducted in accordance with Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. All analyses were conducted using USEPA SW- 846 Method 8260B analytical and reporting protocol. The data contained in this SDG were validated with regard to the following parameters:

- Data completeness
- * Holding times
- Initial/continuing calibrations
- Laboratory method blank results
- Field Duplicate Results
- * Detection Limits

In addition, samples NTC22SB210405 and NTC22MW06S02 was also validated with regard to the following parameters:

- * Surrogate Recoveries
- * Blank Spike/Blank Spike Duplicate Results
- * Matrix Spike/Matrix Spike Duplicate Results
- * Internal Standard Recoveries
- * Compound Quantitation

* • Compound Identification

The symbol (*) indicates that quality control criteria were met for this parameter. Problems affecting data quality are discussed below; documentation supporting these findings is presented in Appendix C. Qualified Analytical results are presented in Appendix A. Results as reported by the laboratory are presented in Appendix B.

Volatile

The following compound was detected in the method blank associated with the diluted aqueous samples:

Compound	Maximum Concentration	Blank Action Level
Tetrachloroethene(1)	0.64 ug/L	6.4 µg/L

- Value < Reporting Limit (RL); report RL followed by a U.
- Value > RL and < Action level; report value followed by a U.
- Value > RL and > Action level; report value followed by a BJ.

1- Concentration detected in a method blank analyzed on 12/1/05 on instrument UX15. Only diluted samples analyzed on this date were evaluated relative to this blank.

No action was taken for blank contamination because the tetrachloroethene concentrations in samples NTC22MW06S02 and NTC22FD03 were greater than 10X the blank action level. Sample NTC22MW10S02 had a tetrachloroethene concentration of 3.5 ug/L, which is less than the adjusted blank action level, but because tetrachloroethene is a compound that may be present in the sample the data validator used professional judgment to qualify the result as estimated, J, instead of negating the result because of the method blank contamination.

A continuing calibration had a %D outside the 25% quality control limit on 11/29/05 at 10:27 for chloroethane. The non-detected result for chloroethane was qualified as estimated, UJ, for sample NTC22SB210405.

Field duplicate imprecision was noted for tetrachloroethene for the field duplicate pairs NTC22SB210405/NTC22FD01 and NTC22SB221112/NTC22FD02. The results for tetrachloroethene have been qualified as estimated in the field duplicate pairs NTC22SB210405/NTC22FD01 and NTC22SB221112/NTC22FD02.

Samples NTC22SB200203, NTC22SB210203, NTC22SB210405, NTC22SB220203, NTC22SB221112, NTC22SB230203, NTC22SB230102, NTC22SB240102, NTC22SB240203, NTCSB250102, NTC22FD01, NTCFD02, NTC22MW10S02, NTC22MW06S02, and NTC22FD03 were analyzed at dilutions due to high concentrations of target analytes. No action was taken based on the dilutions.

Additional Comments:

Positive results less than the reporting limit (RL) were qualified as estimated, J, due to uncertainty near the detection limit.

The laboratory incorrectly transposed a sample ID on the VOA Form I. The sample ID NTC22SB2102 has been corrected in the database to NTC22SB210203.

The original EDD provided by the laboratory did not have data reported for all soil samples. The laboratory was contacted and a new EDD was submitted.

Form Is for all soil samples did not display positive results reported at concentrations below the reporting limit. The laboratory was contacted and re-submitted Form Is were provided. The database was unaffected by this issue.

EXECUTIVE SUMMARY

Laboratory Performance Issues: Chloroethane exceeded the continuing calibration %D criteria. Tetrachloroethene was detected in an aqueous laboratory preparation blank. Several compounds exceeded the linear calibration range of the instrument.

Other factors affecting data quality: Field duplicate imprecision was noted in two field duplicate pairs. Tetrachloroethene was detected in an aqueous laboratory preparation blank.

The data for these analyses were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation (10/99), EPA Region V Validation Guidelines (08/93), and the NFESC guidelines IRCDQM (Sept., 1999). The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC guidelines and the Quality Assurance Project Plan (QAPP)."

Edward Sedlmyer
Tetra Tech NUS

Edward Sedlmyer
Chemist/Data Validator

TetraTech NUS

Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:

Appendix A – Qualified Analytical Results
Appendix B – Results as Reported by the Laboratory
Appendix C – Support Documentation

APPENDIX A

QUALIFIED ANALYTICAL RESULTS

Data Validation Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration Noncompliance (e.g. % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01 = GC/MS Tuning Noncompliance
D = MS/MSD Recovery Noncompliance
E = LCS/LCSD Recovery Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS - GFAA MSA's r < 0.995
K = ICP Interference - includes ICS % R Noncompliance
L = Instrument Calibration Range Exceedance
M = Sample Preservation Noncompliance
N = Internal Standard Noncompliance
N01 = Internal Standard Recovery Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (e.g. base-line drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues; e.g. chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = % Difference between columns/detectors >25% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient r < 0.995
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 sigma deviation is greater than sample activity

APPENDIX A

QUALIFIED ANALYTICAL RESULTS

PROJ_NO: 00202

SDG: 5K18318 MEDIA: SOIL DATA FRACTION: OV

nsample	NTC22FD01
samp_date	11/17/2005
lab_id	A5K180318015
qc_type	NM
units	UG/KG
Pct_Solids	85.0
DUP_OF:	NTC22SB210405

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	2300	U	
1,1,1-TRICHLOROETHANE	160	J	P
1,1,2,2-TETRACHLOROETHANE	2300	U	
1,1,2-TRICHLOROETHANE	2300	U	
1,1-DICHLOROETHANE	2300	U	
1,1-DICHLOROETHENE	2300	U	
1,2-DICHLOROETHANE	2300	U	
CARBON TETRACHLORIDE	2300	U	
CHLOROETHANE	2300	U	
CHLOROMETHANE	2300	U	
CIS-1,2-DICHLOROETHENE	11000		
TETRACHLOROETHENE	74000	J	G
TRANS-1,2-DICHLOROETHENE	2300	U	
TRICHLOROETHENE	7900		
VINYL CHLORIDE	2300	U	

nsample	NTC22FD02
samp_date	11/17/2005
lab_id	A5K180318016
qc_type	NM
units	UG/KG
Pct_Solids	83.0
DUP_OF:	NTC22SB221112

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	3200	U	
1,1,1-TRICHLOROETHANE	3200	U	
1,1,2,2-TETRACHLOROETHANE	3200	U	
1,1,2-TRICHLOROETHANE	3200	U	
1,1-DICHLOROETHANE	3200	U	
1,1-DICHLOROETHENE	3200	U	
1,2-DICHLOROETHANE	3200	U	
CARBON TETRACHLORIDE	3200	U	
CHLOROETHANE	3200	U	
CHLOROMETHANE	3200	U	
CIS-1,2-DICHLOROETHENE	3200	U	
TETRACHLOROETHENE	100000	J	G
TRANS-1,2-DICHLOROETHENE	3200	U	
TRICHLOROETHENE	620	J	P
VINYL CHLORIDE	3200	U	

nsample	NTC22SB200203
samp_date	11/17/2005
lab_id	A5K180318001
qc_type	NM
units	UG/KG
Pct_Solids	82.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	850	U	
1,1,1-TRICHLOROETHANE	850	U	
1,1,2,2-TETRACHLOROETHANE	850	U	
1,1,2-TRICHLOROETHANE	850	U	
1,1-DICHLOROETHANE	850	U	
1,1-DICHLOROETHENE	850	U	
1,2-DICHLOROETHANE	850	U	
CARBON TETRACHLORIDE	850	U	
CHLOROETHANE	850	U	
CHLOROMETHANE	850	U	
CIS-1,2-DICHLOROETHENE	850	U	
TETRACHLOROETHENE	26000		
TRANS-1,2-DICHLOROETHENE	850	U	
TRICHLOROETHENE	850	U	
VINYL CHLORIDE	850	U	

PROJ_NO: 00202

SDG: 5K18318 MEDIA: SOIL DATA FRACTION: OV

nsample	NTC22SB200506
samp_date	11/17/2005
lab_id	A5K180318002
qc_type	NM
units	UG/KG
Pct_Solids	86.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	4.4	U	
1,1,1-TRICHLOROETHANE	4.4	U	
1,1,2,2-TETRACHLOROETHANE	4.4	U	
1,1,2-TRICHLOROETHANE	4.4	U	
1,1-DICHLOROETHANE	4.4	U	
1,1-DICHLOROETHENE	4.4	U	
1,2-DICHLOROETHANE	4.4	U	
CARBON TETRACHLORIDE	4.4	U	
CHLOROETHANE	4.4	U	
CHLOROMETHANE	4.4	U	
CIS-1,2-DICHLOROETHENE	4.4	U	
TETRACHLOROETHENE	4.4	U	
TRANS-1,2-DICHLOROETHENE	4.4	U	
TRICHLOROETHENE	4.4	U	
VINYL CHLORIDE	4.4	U	

nsample	NTC22SB210203
samp_date	11/17/2005
lab_id	A5K180318003
qc_type	NM
units	UG/KG
Pct_Solids	81.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	240	U	
1,1,1-TRICHLOROETHANE	120	J	P
1,1,2,2-TETRACHLOROETHANE	240	U	
1,1,2-TRICHLOROETHANE	240	U	
1,1-DICHLOROETHANE	31	J	P
1,1-DICHLOROETHENE	37	J	P
1,2-DICHLOROETHANE	240	U	
CARBON TETRACHLORIDE	240	U	
CHLOROETHANE	240	U	
CHLOROMETHANE	240	U	
CIS-1,2-DICHLOROETHENE	5800		
TETRACHLOROETHENE	9300		
TRANS-1,2-DICHLOROETHENE	130	J	P
TRICHLOROETHENE	1800		
VINYL CHLORIDE	38	J	P

nsample	NTC22SB210405
samp_date	11/17/2005
lab_id	A5K180318004
qc_type	NM
units	UG/KG
Pct_Solids	80.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	4900	U	
1,1,1-TRICHLOROETHANE	4900	U	
1,1,2,2-TETRACHLOROETHANE	4900	U	
1,1,2-TRICHLOROETHANE	4900	U	
1,1-DICHLOROETHANE	4900	U	
1,1-DICHLOROETHENE	4900	U	
1,2-DICHLOROETHANE	4900	U	
CARBON TETRACHLORIDE	4900	U	
CHLOROETHANE	4900	UJ	C
CHLOROMETHANE	4900	U	
CIS-1,2-DICHLOROETHENE	13000		
TETRACHLOROETHENE	160000	J	G
TRANS-1,2-DICHLOROETHENE	4900	U	
TRICHLOROETHENE	10000		
VINYL CHLORIDE	4900	U	

PROJ_NO: 00202

SDG: 5K18318 MEDIA: SOIL DATA FRACTION: OV

nsample	NTC22SB211112
samp_date	11/17/2005
lab_id	A5K180318005
qc_type	NM
units	UG/KG
Pct_Solids	86.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	4.4	U	
1,1,1-TRICHLOROETHANE	4.4	U	
1,1,2,2-TETRACHLOROETHANE	4.4	U	
1,1,2-TRICHLOROETHANE	4.4	U	
1,1-DICHLOROETHANE	4.4	U	
1,1-DICHLOROETHENE	4.4	U	
1,2-DICHLOROETHANE	4.4	U	
CARBON TETRACHLORIDE	4.4	U	
CHLOROETHANE	4.4	U	
CHLOROMETHANE	4.4	U	
CIS-1,2-DICHLOROETHENE	4.4	U	
TETRACHLOROETHENE	2.4	J	P
TRANS-1,2-DICHLOROETHENE	4.4	U	
TRICHLOROETHENE	4.4	U	
VINYL CHLORIDE	4.4	U	

nsample	NTC22SB220203
samp_date	11/17/2005
lab_id	A5K180318006
qc_type	NM
units	UG/KG
Pct_Solids	82.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	610	U	
1,1,1-TRICHLOROETHANE	610	U	
1,1,2,2-TETRACHLOROETHANE	610	U	
1,1,2-TRICHLOROETHANE	610	U	
1,1-DICHLOROETHANE	610	U	
1,1-DICHLOROETHENE	610	U	
1,2-DICHLOROETHANE	610	U	
CARBON TETRACHLORIDE	610	U	
CHLOROETHANE	610	U	
CHLOROMETHANE	610	U	
CIS-1,2-DICHLOROETHENE	110	J	P
TETRACHLOROETHENE	19000		
TRANS-1,2-DICHLOROETHENE	610	U	
TRICHLOROETHENE	260	J	P
VINYL CHLORIDE	610	U	

nsample	NTC22SB220708
samp_date	11/17/2005
lab_id	A5K180318007
qc_type	NM
units	UG/KG
Pct_Solids	82.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	4.9	U	
1,1,1-TRICHLOROETHANE	4.9	U	
1,1,2,2-TETRACHLOROETHANE	4.9	U	
1,1,2-TRICHLOROETHANE	4.9	U	
1,1-DICHLOROETHANE	4.9	U	
1,1-DICHLOROETHENE	4.9	U	
1,2-DICHLOROETHANE	4.9	U	
CARBON TETRACHLORIDE	4.9	U	
CHLOROETHANE	4.9	U	
CHLOROMETHANE	4.9	U	
CIS-1,2-DICHLOROETHENE	0.56	J	P
TETRACHLOROETHENE	1.4	J	P
TRANS-1,2-DICHLOROETHENE	4.9	U	
TRICHLOROETHENE	4.9	U	
VINYL CHLORIDE	4.9	U	

PROJ_NO: 00202

SDG: 5K18318 MEDIA: SOIL DATA FRACTION: OV

nsample	NTC22SB221112
samp_date	11/17/2005
lab_id	A5K180318008
qc_type	NM
units	UG/KG
Pct_Solids	86.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	5800	U	
1,1,1-TRICHLOROETHANE	5800	U	
1,1,2,2-TETRACHLOROETHANE	5800	U	
1,1,2-TRICHLOROETHANE	5800	U	
1,1-DICHLOROETHANE	5800	U	
1,1-DICHLOROETHENE	5800	U	
1,2-DICHLOROETHANE	5800	U	
CARBON TETRACHLORIDE	5800	U	
CHLOROETHANE	5800	U	
CHLOROMETHANE	5800	U	
CIS-1,2-DICHLOROETHENE	5800	U	
TETRACHLOROETHENE	200000	J	G
TRANS-1,2-DICHLOROETHENE	5800	U	
TRICHLOROETHENE	690	J	P
VINYL CHLORIDE	5800	U	

nsample	NTC22SB230102
samp_date	11/17/2005
lab_id	A5K180318010
qc_type	NM
units	UG/KG
Pct_Solids	79.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	270	U	
1,1,1-TRICHLOROETHANE	270	U	
1,1,2,2-TETRACHLOROETHANE	270	U	
1,1,2-TRICHLOROETHANE	270	U	
1,1-DICHLOROETHANE	270	U	
1,1-DICHLOROETHENE	270	U	
1,2-DICHLOROETHANE	270	U	
CARBON TETRACHLORIDE	270	U	
CHLOROETHANE	270	U	
CHLOROMETHANE	270	U	
CIS-1,2-DICHLOROETHENE	270	U	
TETRACHLOROETHENE	400		
TRANS-1,2-DICHLOROETHENE	270	U	
TRICHLOROETHENE	270	U	
VINYL CHLORIDE	270	U	

nsample	NTC22SB230203
samp_date	11/17/2005
lab_id	A5K180318009
qc_type	NM
units	UG/KG
Pct_Solids	77.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	280	U	
1,1,1-TRICHLOROETHANE	280	U	
1,1,2,2-TETRACHLOROETHANE	280	U	
1,1,2-TRICHLOROETHANE	280	U	
1,1-DICHLOROETHANE	280	U	
1,1-DICHLOROETHENE	280	U	
1,2-DICHLOROETHANE	280	U	
CARBON TETRACHLORIDE	280	U	
CHLOROETHANE	280	U	
CHLOROMETHANE	280	U	
CIS-1,2-DICHLOROETHENE	280	U	
TETRACHLOROETHENE	1200		
TRANS-1,2-DICHLOROETHENE	280	U	
TRICHLOROETHENE	280	U	
VINYL CHLORIDE	280	U	

PROJ_NO: 00202

SDG: 5K18318 MEDIA: SOIL DATA FRACTION: OV

nsample	NTC22SB240102
samp_date	11/17/2005
lab_id	A5K180318011
qc_type	NM
units	UG/KG
Pct_Solids	79.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	270	U	
1,1,1-TRICHLOROETHANE	270	U	
1,1,2,2-TETRACHLOROETHANE	270	U	
1,1,2-TRICHLOROETHANE	270	U	
1,1-DICHLOROETHANE	270	U	
1,1-DICHLOROETHENE	270	U	
1,2-DICHLOROETHANE	270	U	
CARBON TETRACHLORIDE	270	U	
CHLOROETHANE	270	U	
CHLOROMETHANE	270	U	
CIS-1,2-DICHLOROETHENE	270	U	
TETRACHLOROETHENE	720		
TRANS-1,2-DICHLOROETHENE	270	U	
TRICHLOROETHENE	270	U	
VINYL CHLORIDE	270	U	

nsample	NTC22SB240203
samp_date	11/17/2005
lab_id	A5K180318012
qc_type	NM
units	UG/KG
Pct_Solids	80.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	330	U	
1,1,1-TRICHLOROETHANE	330	U	
1,1,2,2-TETRACHLOROETHANE	330	U	
1,1,2-TRICHLOROETHANE	330	U	
1,1-DICHLOROETHANE	330	U	
1,1-DICHLOROETHENE	330	U	
1,2-DICHLOROETHANE	330	U	
CARBON TETRACHLORIDE	330	U	
CHLOROETHANE	330	U	
CHLOROMETHANE	330	U	
CIS-1,2-DICHLOROETHENE	330	U	
TETRACHLOROETHENE	1200		
TRANS-1,2-DICHLOROETHENE	330	U	
TRICHLOROETHENE	330	U	
VINYL CHLORIDE	330	U	

nsample	NTC22SB250102
samp_date	11/17/2005
lab_id	A5K180318013
qc_type	NM
units	UG/KG
Pct_Solids	77.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	260	U	
1,1,1-TRICHLOROETHANE	260	U	
1,1,2,2-TETRACHLOROETHANE	260	U	
1,1,2-TRICHLOROETHANE	260	U	
1,1-DICHLOROETHANE	260	U	
1,1-DICHLOROETHENE	260	U	
1,2-DICHLOROETHANE	260	U	
CARBON TETRACHLORIDE	260	U	
CHLOROETHANE	260	U	
CHLOROMETHANE	260	U	
CIS-1,2-DICHLOROETHENE	260	U	
TETRACHLOROETHENE	2800		
TRANS-1,2-DICHLOROETHENE	260	U	
TRICHLOROETHENE	260	U	
VINYL CHLORIDE	260	U	

PROJ_NO: 00202

SDG: 5K18318 MEDIA: SOIL DATA FRACTION: OV

nsample	NTC22SB250203
samp_date	11/17/2005
lab_id	A5K180318014
qc_type	NM
units	UG/KG
Pct_Solids	83.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	5	U	
1,1,1-TRICHLOROETHANE	5	U	
1,1,2,2-TETRACHLOROETHANE	5	U	
1,1,2-TRICHLOROETHANE	5	U	
1,1-DICHLOROETHANE	5	U	
1,1-DICHLOROETHENE	5	U	
1,2-DICHLOROETHANE	5	U	
CARBON TETRACHLORIDE	5	U	
CHLOROETHANE	5	U	
CHLOROMETHANE	5	U	
CIS-1,2-DICHLOROETHENE	5	U	
TETRACHLOROETHENE	1.3	J	P
TRANS-1,2-DICHLOROETHENE	5	U	
TRICHLOROETHENE	5	U	
VINYL CHLORIDE	5	U	

PROJ_NO: 00202

SDG: 5K18318 MEDIA: WATER DATA FRACTION: OV

nsample	NTC22FD03
samp_date	11/20/2005
lab_id	A5K220298005
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	NTC22MW06S02

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	1400	U	
1,1,1-TRICHLOROETHANE	1400	U	
1,1,2,2-TETRACHLOROETHANE	1400	U	
1,1,2-TRICHLOROETHANE	1400	U	
1,1-DICHLOROETHANE	1400	U	
1,1-DICHLOROETHENE	1400	U	
1,2-DICHLOROETHANE	1400	U	
CARBON TETRACHLORIDE	1400	U	
CHLOROETHANE	1400	U	
CHLOROMETHANE	1400	U	
CIS-1,2-DICHLOROETHENE	870	J	P
TETRACHLOROETHENE	43000		
TRANS-1,2-DICHLOROETHENE	1400	U	
TRICHLOROETHENE	730	J	P
VINYL CHLORIDE	1400	U	

nsample	NTC22MW05S02
samp_date	11/20/2005
lab_id	A5K220298001
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	1	U	
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2-DICHLOROETHANE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROETHANE	1	U	
CHLOROMETHANE	1	U	
CIS-1,2-DICHLOROETHENE	1	U	
TETRACHLOROETHENE	1	U	
TRANS-1,2-DICHLOROETHENE	1	U	
TRICHLOROETHENE	1	U	
VINYL CHLORIDE	1	U	

nsample	NTC22MW06S02
samp_date	11/20/2005
lab_id	A5K220298004
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	1400	U	
1,1,1-TRICHLOROETHANE	1400	U	
1,1,2,2-TETRACHLOROETHANE	1400	U	
1,1,2-TRICHLOROETHANE	1400	U	
1,1-DICHLOROETHANE	1400	U	
1,1-DICHLOROETHENE	1400	U	
1,2-DICHLOROETHANE	1400	U	
CARBON TETRACHLORIDE	1400	U	
CHLOROETHANE	1400	U	
CHLOROMETHANE	1400	U	
CIS-1,2-DICHLOROETHENE	930	J	P
TETRACHLOROETHENE	45000		
TRANS-1,2-DICHLOROETHENE	1400	U	
TRICHLOROETHENE	760	J	P
VINYL CHLORIDE	1400	U	

PROJ_NO: 00202

SDG: 5K18318 MEDIA: WATER DATA FRACTION: OV

nsample	NTC22MW10D02
samp_date	11/20/2005
lab_id	A5K220298002
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	1	U	
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2-DICHLOROETHANE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROETHANE	1	U	
CHLOROMETHANE	1	U	
CIS-1,2-DICHLOROETHENE	4		
TETRACHLOROETHENE	1	U	
TRANS-1,2-DICHLOROETHENE	0.38	J	P
TRICHLOROETHENE	1	U	
VINYL CHLORIDE	1.3		

nsample	NTC22MW10S02
samp_date	11/20/2005
lab_id	A5K220298003
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	2	U	
1,1,1-TRICHLOROETHANE	2	U	
1,1,2,2-TETRACHLOROETHANE	2	U	
1,1,2-TRICHLOROETHANE	2	U	
1,1-DICHLOROETHANE	2	U	
1,1-DICHLOROETHENE	2	U	
1,2-DICHLOROETHANE	2	U	
CARBON TETRACHLORIDE	2	U	
CHLOROETHANE	2	U	
CHLOROMETHANE	2	U	
CIS-1,2-DICHLOROETHENE	52		
TETRACHLOROETHENE	3.5	BJ	A
TRANS-1,2-DICHLOROETHENE	0.56	J	P
TRICHLOROETHENE	2	U	
VINYL CHLORIDE	2	U	

nsample	NTC22TB01
samp_date	11/17/2005
lab_id	A5K180318017
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	1	U	
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2-DICHLOROETHANE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROETHANE	1	U	
CHLOROMETHANE	1	U	
CIS-1,2-DICHLOROETHENE	1	U	
TETRACHLOROETHENE	1	U	
TRANS-1,2-DICHLOROETHENE	1	U	
TRICHLOROETHENE	1	U	
VINYL CHLORIDE	1	U	

APPENDIX B

RESULTS AS REPORTED BY THE LABORATORY

Tetra Tech NUS, Inc

Client Sample ID: NTC22FD01

GC/MS Volatiles

Lot-Sample #...:	A5K180318-015	**Work Order #...:**	HQKD71AC	**Matrix.........:**	SO
Date Sampled...:	11/17/05	**Date Received..:**	11/18/05		
Prep Date......:	11/18/05	**Analysis Date..:**	11/29/05		
Prep Batch #...:	5333323				
Dilution Factor:	7.96	**Initial Wgt/Vol:**	6.28 g	**Final Wgt/Vol..:**	5 mL
% Moisture.....:	15	**Method.........:**	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Carbon tetrachloride	ND	2300	ug/kg
Chloroethane	ND	2300	ug/kg
Chloromethane	ND	2300	ug/kg
1,1-Dichloroethane	ND	2300	ug/kg
1,2-Dichloroethane	ND	2300	ug/kg
1,1-Dichloroethene	ND	2300	ug/kg
cis-1,2-Dichloroethene	**11000**	**2300**	**ug/kg**
trans-1,2-Dichloroethene	ND	2300	ug/kg
1,1,1,2-Tetrachloroethane	ND	2300	ug/kg
1,1,2,2-Tetrachloroethane	ND	2300	ug/kg
Tetrachloroethene	**74000**	**2300**	**ug/kg**
1,1,1-Trichloroethane	**160 J**	**2300**	**ug/kg**
1,1,2-Trichloroethane	ND	2300	ug/kg
Trichloroethene	**7900**	**2300**	**ug/kg**
Vinyl chloride	ND	2300	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	75 DIL	(59 - 138)
1,2-Dichloroethane-d4	79 DIL	(61 - 130)
Toluene-d8	75 DIL	(60 - 143)
4-Bromofluorobenzene	59 DIL	(47 - 158)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

Tetra Tech NUS, Inc

Client Sample ID: NTC22FD02

GC/MS Volatiles

Lot-Sample #...: A5K180318-016 **Work Order #...:** HQKE51AC **Matrix.........:** SO
Date Sampled...: 11/17/05 **Date Received..:** 11/18/05
Prep Date......: 11/18/05 **Analysis Date..:** 11/29/05
Prep Batch #...: 5333323
Dilution Factor: 10.74 **Initial Wgt/Vol:** 6.65 g **Final Wgt/Vol..:** 5 mL
% Moisture.....: 17 **Method.........:** SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Carbon tetrachloride	ND	3200	ug/kg
Chloroethane	ND	3200	ug/kg
Chloromethane	ND	3200	ug/kg
1,1-Dichloroethane	ND	3200	ug/kg
1,2-Dichloroethane	ND	3200	ug/kg
1,1-Dichloroethene	ND	3200	ug/kg
cis-1,2-Dichloroethene	ND	3200	ug/kg
trans-1,2-Dichloroethene	ND	3200	ug/kg
1,1,1,2-Tetrachloroethane	ND	3200	ug/kg
1,1,2,2-Tetrachloroethane	ND	3200	ug/kg
Tetrachloroethene	**100000**	**3200**	**ug/kg**
1,1,1-Trichloroethane	ND	3200	ug/kg
1,1,2-Trichloroethane	ND	3200	ug/kg
Trichloroethene	**620 J**	**3200**	**ug/kg**
Vinyl chloride	ND	3200	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	64 DIL	(59 - 138)
1,2-Dichloroethane-d4	59 DIL,*	(61 - 130)
Toluene-d8	56 DIL,*	(60 - 143)
4-Bromofluorobenzene	48 DIL	(47 - 158)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

* *Surrogate recovery is outside stated control limits.*

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

Tetra Tech NUS, Inc

Client Sample ID: NTC22SB200203

GC/MS Volatiles

Lot-Sample #...:	A5K180318-001	**Work Order #...:**	HQKCL1AC	**Matrix.........:**	SO
Date Sampled...:	11/17/05 14:20	**Date Received..:**	11/18/05		
Prep Date......:	11/18/05	**Analysis Date..:**	11/29/05		
Prep Batch #...:	5333323				
Dilution Factor:	2.76	**Initial Wgt/Vol:**	6.03 g	**Final Wgt/Vol..:**	5 mL
% Moisture.....:	18	**Method.........:**	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Carbon tetrachloride	ND	850	ug/kg
Chloroethane	ND	850	ug/kg
Chloromethane	ND	850	ug/kg
1,1-Dichloroethane	ND	850	ug/kg
1,2-Dichloroethane	ND	850	ug/kg
1,1-Dichloroethene	ND	850	ug/kg
cis-1,2-Dichloroethene	ND	850	ug/kg
trans-1,2-Dichloroethene	ND	850	ug/kg
1,1,1,2-Tetrachloroethane	ND	850	ug/kg
1,1,2,2-Tetrachloroethane	ND	850	ug/kg
Tetrachloroethene	**26000**	**850**	**ug/kg**
1,1,1-Trichloroethane	ND	850	ug/kg
1,1,2-Trichloroethane	ND	850	ug/kg
Trichloroethene	ND	850	ug/kg
Vinyl chloride	ND	850	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	66 DIL	(59 - 138)
1,2-Dichloroethane-d4	68 DIL	(61 - 130)
Toluene-d8	65 DIL	(60 - 143)
4-Bromofluorobenzene	50 DIL	(47 - 158)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Results and reporting limits have been adjusted for dry weight.

Tetra Tech NUS, Inc

Client Sample ID: NTC22SB200506

GC/MS Volatiles

Lot-Sample #...:	A5K180318-002	**Work Order #...:**	HQKC51AC	**Matrix.........:**	SO
Date Sampled...:	11/17/05 14:40	**Date Received..:**	11/18/05		
Prep Date......:	11/29/05	**Analysis Date..:**	11/29/05		
Prep Batch #...:	5334268				
Dilution Factor:	0.76	**Initial Wgt/Vol:**	5 g	**Final Wgt/Vol..:**	5 mL
% Moisture.....:	14	**Method.........:**	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Carbon tetrachloride	ND	4.4	ug/kg
Chloroethane	ND	4.4	ug/kg
Chloromethane	ND	4.4	ug/kg
1,1-Dichloroethane	ND	4.4	ug/kg
1,2-Dichloroethane	ND	4.4	ug/kg
1,1-Dichloroethene	ND	4.4	ug/kg
cis-1,2-Dichloroethene	ND	4.4	ug/kg
trans-1,2-Dichloroethene	ND	4.4	ug/kg
1,1,1,2-Tetrachloroethane	ND	4.4	ug/kg
1,1,2,2-Tetrachloroethane	ND	4.4	ug/kg
Tetrachloroethene	ND	4.4	ug/kg
1,1,1-Trichloroethane	ND	4.4	ug/kg
1,1,2-Trichloroethane	ND	4.4	ug/kg
Trichloroethene	ND	4.4	ug/kg
Vinyl chloride	ND	4.4	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	99	(59 - 138)
1,2-Dichloroethane-d4	93	(61 - 130)
Toluene-d8	99	(60 - 143)
4-Bromofluorobenzene	70	(47 - 158)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

Tetra Tech NUS, Inc

Client Sample ID: NTC22SB210203

GC/MS Volatiles

Lot-Sample #...:	A5K180318-003	**Work Order #...:**	HQKC91AC	**Matrix.........:**	SO
Date Sampled...:	11/17/05 15:15	**Date Received..:**	11/18/05		
Prep Date......:	11/18/05	**Analysis Date..:**	11/29/05		
Prep Batch #...:	5333323				
Dilution Factor:	0.79	**Initial Wgt/Vol:**	6.32 g	**Final Wgt/Vol..:**	5 mL
% Moisture.....:	19	**Method.........:**	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Carbon tetrachloride	ND	240	ug/kg
Chloroethane	ND	240	ug/kg
Chloromethane	ND	240	ug/kg
1,1-Dichloroethane	**31 J**	**240**	**ug/kg**
1,2-Dichloroethane	ND	240	ug/kg
1,1-Dichloroethene	**37 J**	**240**	**ug/kg**
cis-1,2-Dichloroethene	**5800**	**240**	**ug/kg**
trans-1,2-Dichloroethene	**130 J**	**240**	**ug/kg**
1,1,1,2-Tetrachloroethane	ND	240	ug/kg
1,1,2,2-Tetrachloroethane	ND	240	ug/kg
Tetrachloroethene	**9300**	**240**	**ug/kg**
1,1,1-Trichloroethane	**120 J**	**240**	**ug/kg**
1,1,2-Trichloroethane	ND	240	ug/kg
Trichloroethene	**1800**	**240**	**ug/kg**
Vinyl chloride	**38 J**	**240**	**ug/kg**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	68	(59 - 138)
1,2-Dichloroethane-d4	68	(61 - 130)
Toluene-d8	70	(60 - 143)
4-Bromofluorobenzene	56	(47 - 158)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

Tetra Tech NUS, Inc

Client Sample ID: NTC22SB210405

GC/MS Volatiles

Lot-Sample #...:	A5K180318-004	**Work Order #...:**	HQKDC1AC	**Matrix.........:**	SO
Date Sampled...:	11/17/05 15:45	**Date Received..:**	11/18/05		
Prep Date......:	11/18/05	**Analysis Date..:**	11/29/05		
Prep Batch #...:	5333323				
Dilution Factor:	15.8	**Initial Wgt/Vol:**	6.33 g	**Final Wgt/Vol..:**	5 mL
% Moisture.....:	20	**Method.........:**	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Carbon tetrachloride	ND	4900	ug/kg
Chloroethane	ND	4900	ug/kg
Chloromethane	ND	4900	ug/kg
1,1-Dichloroethane	ND	4900	ug/kg
1,2-Dichloroethane	ND	4900	ug/kg
1,1-Dichloroethene	ND	4900	ug/kg
cis-1,2-Dichloroethene	**13000**	**4900**	**ug/kg**
trans-1,2-Dichloroethene	ND	4900	ug/kg
1,1,1,2-Tetrachloroethane	ND	4900	ug/kg
1,1,2,2-Tetrachloroethane	ND	4900	ug/kg
Tetrachloroethene	**160000**	**4900**	**ug/kg**
1,1,1-Trichloroethane	ND	4900	ug/kg
1,1,2-Trichloroethane	ND	4900	ug/kg
Trichloroethene	**10000**	**4900**	**ug/kg**
Vinyl chloride	ND	4900	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	68 DIL	(59 - 138)
1,2-Dichloroethane-d4	0.0 DIL,*	(61 - 130)
Toluene-d8	66 DIL	(60 - 143)
4-Bromofluorobenzene	66 DIL	(47 - 158)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

* Surrogate recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

Tetra Tech NUS, Inc

Client Sample ID: NTC22SB211112

GC/MS Volatiles

Lot-Sample #...:	A5K180318-005	**Work Order #...:**	HQKDF1AC	**Matrix.........:**	SO
Date Sampled...:	11/17/05 16:00	**Date Received..:**	11/18/05		
Prep Date......:	11/29/05	**Analysis Date..:**	11/29/05		
Prep Batch #...:	5334268				
Dilution Factor:	0.76	**Initial Wgt/Vol:**	5 g	**Final Wgt/Vol..:**	5 mL
% Moisture.....:	14	**Method.........:**	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Carbon tetrachloride	ND	4.4	ug/kg
Chloroethane	ND	4.4	ug/kg
Chloromethane	ND	4.4	ug/kg
1,1-Dichloroethane	ND	4.4	ug/kg
1,2-Dichloroethane	ND	4.4	ug/kg
1,1-Dichloroethene	ND	4.4	ug/kg
cis-1,2-Dichloroethene	ND	4.4	ug/kg
trans-1,2-Dichloroethene	ND	4.4	ug/kg
1,1,1,2-Tetrachloroethane	ND	4.4	ug/kg
1,1,2,2-Tetrachloroethane	ND	4.4	ug/kg
Tetrachloroethene	**2.4 J**	**4.4**	**ug/kg**
1,1,1-Trichloroethane	ND	4.4	ug/kg
1,1,2-Trichloroethane	ND	4.4	ug/kg
Trichloroethene	ND	4.4	ug/kg
Vinyl chloride	ND	4.4	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	102	(59 - 138)
1,2-Dichloroethane-d4	91	(61 - 130)
Toluene-d8	94	(60 - 143)
4-Bromofluorobenzene	59	(47 - 158)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

Tetra Tech NUS, Inc

Client Sample ID: NTC22SB220203

GC/MS Volatiles

Lot-Sample #...:	A5K180318-006	**Work Order #...:**	HQKDG1AC	**Matrix.........:**	SO
Date Sampled...:	11/17/05 17:00	**Date Received..:**	11/18/05		
Prep Date......:	11/18/05	**Analysis Date..:**	11/29/05		
Prep Batch #...:	5333323				
Dilution Factor:	2.02	**Initial Wgt/Vol:**	6.18 g	**Final Wgt/Vol..:**	5 mL
% Moisture.....:	18	**Method.........:**	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Carbon tetrachloride	ND	610	ug/kg
Chloroethane	ND	610	ug/kg
Chloromethane	ND	610	ug/kg
1,1-Dichloroethane	ND	610	ug/kg
1,2-Dichloroethane	ND	610	ug/kg
1,1-Dichloroethene	ND	610	ug/kg
cis-1,2-Dichloroethene	**110 J**	**610**	**ug/kg**
trans-1,2-Dichloroethene	ND	610	ug/kg
1,1,1,2-Tetrachloroethane	ND	610	ug/kg
1,1,2,2-Tetrachloroethane	ND	610	ug/kg
Tetrachloroethene	**19000**	**610**	**ug/kg**
1,1,1-Trichloroethane	ND	610	ug/kg
1,1,2-Trichloroethane	ND	610	ug/kg
Trichloroethene	**260 J**	**610**	**ug/kg**
Vinyl chloride	ND	610	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	61 DIL	(59 - 138)
1,2-Dichloroethane-d4	62 DIL	(61 - 130)
Toluene-d8	62 DIL	(60 - 143)
4-Bromofluorobenzene	51 DIL	(47 - 158)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

Tetra Tech NUS, Inc

Client Sample ID: NTC22SB220708

GC/MS Volatiles

Lot-Sample #...: A5K180318-007	**Work Order #...:** HQKDH1AC	**Matrix.........:** SO	
Date Sampled...: 11/17/05 17:10	**Date Received..:** 11/18/05		
Prep Date......: 11/29/05	**Analysis Date..:** 11/29/05		
Prep Batch #...: 5334268			
Dilution Factor: 0.81	**Initial Wgt/Vol:** 5 g	**Final Wgt/Vol..:** 5 mL	
% Moisture.....: 18	**Method.........:** SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Carbon tetrachloride	ND	4.9	ug/kg
Chloroethane	ND	4.9	ug/kg
Chloromethane	ND	4.9	ug/kg
1,1-Dichloroethane	ND	4.9	ug/kg
1,2-Dichloroethane	ND	4.9	ug/kg
1,1-Dichloroethene	ND	4.9	ug/kg
cis-1,2-Dichloroethene	**0.56 J**	**4.9**	**ug/kg**
trans-1,2-Dichloroethene	ND	4.9	ug/kg
1,1,1,2-Tetrachloroethane	ND	4.9	ug/kg
1,1,2,2-Tetrachloroethane	ND	4.9	ug/kg
Tetrachloroethene	**1.4 J**	**4.9**	**ug/kg**
1,1,1-Trichloroethane	ND	4.9	ug/kg
1,1,2-Trichloroethane	ND	4.9	ug/kg
Trichloroethene	ND	4.9	ug/kg
Vinyl chloride	ND	4.9	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	100	(59 - 138)
1,2-Dichloroethane-d4	91	(61 - 130)
Toluene-d8	97	(60 - 143)
4-Bromofluorobenzene	62	(47 - 158)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

Tetra Tech NUS, Inc

Client Sample ID: NTC22SB221112

GC/MS Volatiles

Lot-Sample #...: A5K180318-008 **Work Order #...:** HQKDL1AC **Matrix.........:** SO
Date Sampled...: 11/17/05 17:30 **Date Received..:** 11/18/05
Prep Date......: 11/18/05 **Analysis Date..:** 11/28/05
Prep Batch #...: 5333323
Dilution Factor: 19.92 **Initial Wgt/Vol:** 5.02 g **Final Wgt/Vol..:** 5 mL
% Moisture.....: 14 **Method.........:** SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Carbon tetrachloride	ND	5800	ug/kg
Chloroethane	ND	5800	ug/kg
Chloromethane	ND	5800	ug/kg
1,1-Dichloroethane	ND	5800	ug/kg
1,2-Dichloroethane	ND	5800	ug/kg
1,1-Dichloroethene	ND	5800	ug/kg
cis-1,2-Dichloroethene	ND	5800	ug/kg
trans-1,2-Dichloroethene	ND	5800	ug/kg
1,1,1,2-Tetrachloroethane	ND	5800	ug/kg
1,1,2,2-Tetrachloroethane	ND	5800	ug/kg
Tetrachloroethene	**200000**	**5800**	**ug/kg**
1,1,1-Trichloroethane	ND	5800	ug/kg
1,1,2-Trichloroethane	ND	5800	ug/kg
Trichloroethene	**690 J**	**5800**	**ug/kg**
Vinyl chloride	ND	5800	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	69 DIL	(59 - 138)
1,2-Dichloroethane-d4	73 DIL	(61 - 130)
Toluene-d8	63 DIL	(60 - 143)
4-Bromofluorobenzene	56 DIL	(47 - 158)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

Tetra Tech NUS, Inc

Client Sample ID: NTC22SB230102

GC/MS Volatiles

Lot-Sample #...:	A5K180318-010	**Work Order #...:**	HQKDW1AC	**Matrix.........:**	SO
Date Sampled...:	11/17/05 13:10	**Date Received..:**	11/18/05		
Prep Date......:	11/18/05	**Analysis Date..:**	11/29/05		
Prep Batch #...:	5333323				
Dilution Factor:	0.84	**Initial Wgt/Vol:**	5.94 g	**Final Wgt/Vol..:**	5 mL
% Moisture.....:	21	**Method.........:**	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Carbon tetrachloride	ND	270	ug/kg
Chloroethane	ND	270	ug/kg
Chloromethane	ND	270	ug/kg
1,1-Dichloroethane	ND	270	ug/kg
1,2-Dichloroethane	ND	270	ug/kg
1,1-Dichloroethene	ND	270	ug/kg
cis-1,2-Dichloroethene	ND	270	ug/kg
trans-1,2-Dichloroethene	ND	270	ug/kg
1,1,1,2-Tetrachloroethane	ND	270	ug/kg
1,1,2,2-Tetrachloroethane	ND	270	ug/kg
Tetrachloroethene	**400**	**270**	**ug/kg**
1,1,1-Trichloroethane	ND	270	ug/kg
1,1,2-Trichloroethane	ND	270	ug/kg
Trichloroethene	ND	270	ug/kg
Vinyl chloride	ND	270	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	64	(59 - 138)
1,2-Dichloroethane-d4	64	(61 - 130)
Toluene-d8	66	(60 - 143)
4-Bromofluorobenzene	56	(47 - 158)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

Tetra Tech NUS, Inc

Client Sample ID: NTC22SB230203

GC/MS Volatiles

Lot-Sample #...:	A5K180318-009	**Work Order #...:**	HQKDT1AC	**Matrix.........:**	SO
Date Sampled...:	11/17/05 13:30	**Date Received..:**	11/18/05		
Prep Date......:	11/18/05	**Analysis Date..:**	11/29/05		
Prep Batch #...:	5333323				
Dilution Factor:	0.88	**Initial Wgt/Vol:**	5.69 g	**Final Wgt/Vol..:**	5 mL
% Moisture.....:	23	**Method.........:**	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Carbon tetrachloride	ND	280	ug/kg
Chloroethane	ND	280	ug/kg
Chloromethane	ND	280	ug/kg
1,1-Dichloroethane	ND	280	ug/kg
1,2-Dichloroethane	ND	280	ug/kg
1,1-Dichloroethene	ND	280	ug/kg
cis-1,2-Dichloroethene	ND	280	ug/kg
trans-1,2-Dichloroethene	ND	280	ug/kg
1,1,1,2-Tetrachloroethane	ND	280	ug/kg
1,1,2,2-Tetrachloroethane	ND	280	ug/kg
Tetrachloroethene	**1200**	**280**	**ug/kg**
1,1,1-Trichloroethane	ND	280	ug/kg
1,1,2-Trichloroethane	ND	280	ug/kg
Trichloroethene	ND	280	ug/kg
Vinyl chloride	ND	280	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	68	(59 - 138)
1,2-Dichloroethane-d4	67	(61 - 130)
Toluene-d8	72	(60 - 143)
4-Bromofluorobenzene	58	(47 - 158)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

Tetra Tech NUS, Inc

Client Sample ID: NTC22SB240102

GC/MS Volatiles

Lot-Sample #...:	A5K180318-011	**Work Order #...:**	HQKD01AC	**Matrix.........:**	SO
Date Sampled...:	11/17/05 12:30	**Date Received..:**	11/18/05		
Prep Date......:	11/18/05	**Analysis Date..:**	11/29/05		
Prep Batch #...:	5333323				
Dilution Factor:	0.85	**Initial Wgt/Vol:**	5.86 g	**Final Wgt/Vol..:**	5 mL
% Moisture.....:	21	**Method.........:**	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Carbon tetrachloride	ND	270	ug/kg
Chloroethane	ND	270	ug/kg
Chloromethane	ND	270	ug/kg
1,1-Dichloroethane	ND	270	ug/kg
1,2-Dichloroethane	ND	270	ug/kg
1,1-Dichloroethene	ND	270	ug/kg
cis-1,2-Dichloroethene	ND	270	ug/kg
trans-1,2-Dichloroethene	ND	270	ug/kg
1,1,1,2-Tetrachloroethane	ND	270	ug/kg
1,1,2,2-Tetrachloroethane	ND	270	ug/kg
Tetrachloroethene	**720**	**270**	**ug/kg**
1,1,1-Trichloroethane	ND	270	ug/kg
1,1,2-Trichloroethane	ND	270	ug/kg
Trichloroethene	ND	270	ug/kg
Vinyl chloride	ND	270	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	68	(59 - 138)
1,2-Dichloroethane-d4	66	(61 - 130)
Toluene-d8	70	(60 - 143)
4-Bromofluorobenzene	57	(47 - 158)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

Tetra Tech NUS, Inc

Client Sample ID: NTC22SB240203

GC/MS Volatiles

Lot-Sample #...:	A5K180318-012	**Work Order #...:**	HQKD11AC	**Matrix.........:**	SO
Date Sampled...:	11/17/05 12:30	**Date Received..:**	11/18/05		
Prep Date......:	11/18/05	**Analysis Date..:**	11/29/05		
Prep Batch #...:	5333323				
Dilution Factor:	1.05	**Initial Wgt/Vol:**	4.76 g	**Final Wgt/Vol..:**	5 mL
% Moisture.....:	20	**Method.........:**	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Carbon tetrachloride	ND	330	ug/kg
Chloroethane	ND	330	ug/kg
Chloromethane	ND	330	ug/kg
1,1-Dichloroethane	ND	330	ug/kg
1,2-Dichloroethane	ND	330	ug/kg
1,1-Dichloroethene	ND	330	ug/kg
cis-1,2-Dichloroethene	ND	330	ug/kg
trans-1,2-Dichloroethene	ND	330	ug/kg
1,1,1,2-Tetrachloroethane	ND	330	ug/kg
1,1,2,2-Tetrachloroethane	ND	330	ug/kg
Tetrachloroethene	**1200**	**330**	**ug/kg**
1,1,1-Trichloroethane	ND	330	ug/kg
1,1,2-Trichloroethane	ND	330	ug/kg
Trichloroethene	ND	330	ug/kg
Vinyl chloride	ND	330	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	73	(59 - 138)
1,2-Dichloroethane-d4	74	(61 - 130)
Toluene-d8	77	(60 - 143)
4-Bromofluorobenzene	63	(47 - 158)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

Tetra Tech NUS, Inc

Client Sample ID: NTC22SB250102

GC/MS Volatiles

Lot-Sample #...:	A5K180318-013	**Work Order #...:**	HQKD21AC	**Matrix.........:**	SO
Date Sampled...:	11/17/05	**Date Received..:**	11/18/05		
Prep Date......:	11/18/05	**Analysis Date..:**	11/29/05		
Prep Batch #...:	5333323				
Dilution Factor:	0.8	**Initial Wgt/Vol:**	6.26 g	**Final Wgt/Vol..:**	5 mL
% Moisture.....:	23	**Method.........:**	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Carbon tetrachloride	ND	260	ug/kg
Chloroethane	ND	260	ug/kg
Chloromethane	ND	260	ug/kg
1,1-Dichloroethane	ND	260	ug/kg
1,2-Dichloroethane	ND	260	ug/kg
1,1-Dichloroethene	ND	260	ug/kg
cis-1,2-Dichloroethene	ND	260	ug/kg
trans-1,2-Dichloroethene	ND	260	ug/kg
1,1,1,2-Tetrachloroethane	ND	260	ug/kg
1,1,2,2-Tetrachloroethane	ND	260	ug/kg
Tetrachloroethene	**2800**	**260**	**ug/kg**
1,1,1-Trichloroethane	ND	260	ug/kg
1,1,2-Trichloroethane	ND	260	ug/kg
Trichloroethene	ND	260	ug/kg
Vinyl chloride	ND	260	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	69	(59 - 138)
1,2-Dichloroethane-d4	72	(61 - 130)
Toluene-d8	72	(60 - 143)
4-Bromofluorobenzene	58	(47 - 158)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

Tetra Tech NUS, Inc

Client Sample ID: NTC22SB250203

GC/MS Volatiles

Lot-Sample #...:	A5K180318-014	**Work Order #...:**	HQKD41AC	**Matrix.........:**	SO
Date Sampled...:	11/17/05	**Date Received..:**	11/18/05		
Prep Date......:	11/30/05	**Analysis Date..:**	11/30/05		
Prep Batch #...:	5335163				
Dilution Factor:	0.83	**Initial Wgt/Vol:**	5 g	**Final Wgt/Vol..:**	5 mL
% Moisture.....:	17	**Method.........:**	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Carbon tetrachloride	ND	5.0	ug/kg
Chloroethane	ND	5.0	ug/kg
Chloromethane	ND	5.0	ug/kg
1,1-Dichloroethane	ND	5.0	ug/kg
1,2-Dichloroethane	ND	5.0	ug/kg
1,1-Dichloroethene	ND	5.0	ug/kg
cis-1,2-Dichloroethene	ND	5.0	ug/kg
trans-1,2-Dichloroethene	ND	5.0	ug/kg
1,1,1,2-Tetrachloroethane	ND	5.0	ug/kg
1,1,2,2-Tetrachloroethane	ND	5.0	ug/kg
Tetrachloroethene	**1.3 J**	**5.0**	**ug/kg**
1,1,1-Trichloroethane	ND	5.0	ug/kg
1,1,2-Trichloroethane	ND	5.0	ug/kg
Trichloroethene	ND	5.0	ug/kg
Vinyl chloride	ND	5.0	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	89	(59 - 138)
1,2-Dichloroethane-d4	85	(61 - 130)
Toluene-d8	113	(60 - 143)
4-Bromofluorobenzene	64	(47 - 158)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

Tetra Tech NUS, Inc

Client Sample ID: NTC22FD03

GC/MS Volatiles

Lot-Sample #...:	A5K220298-005	**Work Order #...:**	HQRE41AA	**Matrix.........:**	WG
Date Sampled...:	11/20/05	**Date Received..:**	11/22/05		
Prep Date......:	12/01/05	**Analysis Date..:**	12/01/05		
Prep Batch #...:	5336244				
Dilution Factor:	1428.6	**Initial Wgt/Vol:**	5 mL	**Final Wgt/Vol..:**	5 mL
		Method.........:	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Carbon tetrachloride	ND	1400	ug/L
Chloroethane	ND	1400	ug/L
Chloromethane	ND	1400	ug/L
1,1-Dichloroethane	ND	1400	ug/L
1,2-Dichloroethane	ND	1400	ug/L
cis-1,2-Dichloroethene	**870 J**	**1400**	**ug/L**
trans-1,2-Dichloroethene	ND	1400	ug/L
1,1-Dichloroethene	ND	1400	ug/L
1,1,1,2-Tetrachloroethane	ND	1400	ug/L
1,1,2,2-Tetrachloroethane	ND	1400	ug/L
Tetrachloroethene	**43000 B**	**1400**	**ug/L**
1,1,1-Trichloroethane	ND	1400	ug/L
1,1,2-Trichloroethane	ND	1400	ug/L
Trichloroethene	**730 J**	**1400**	**ug/L**
Vinyl chloride	ND	1400	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	107	(73 - 122)
1,2-Dichloroethane-d4	108	(61 - 128)
Toluene-d8	107	(76 - 110)
4-Bromofluorobenzene	86	(74 - 116)

NOTE(S):

J Estimated result. Result is less than RL.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

Tetra Tech NUS, Inc

Client Sample ID: NTC22MW05S02

GC/MS Volatiles

Lot-Sample #...:	A5K220298-001	**Work Order #...:**	HQREP1AA	**Matrix.........:**	WG
Date Sampled...:	11/20/05 11:40	**Date Received..:**	11/22/05		
Prep Date......:	11/30/05	**Analysis Date..:**	11/30/05		
Prep Batch #...:	5335104				
Dilution Factor:	1	**Initial Wgt/Vol:**	5 mL	**Final Wgt/Vol..:**	5 mL
		Method.........:	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Carbon tetrachloride	ND	1.0	ug/L
Chloroethane	ND	1.0	ug/L
Chloromethane	ND	1.0	ug/L
1,1-Dichloroethane	ND	1.0	ug/L
1,2-Dichloroethane	ND	1.0	ug/L
cis-1,2-Dichloroethene	ND	1.0	ug/L
trans-1,2-Dichloroethene	ND	1.0	ug/L
1,1-Dichloroethene	ND	1.0	ug/L
1,1,1,2-Tetrachloroethane	ND	1.0	ug/L
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L
Tetrachloroethene	ND	1.0	ug/L
1,1,1-Trichloroethane	ND	1.0	ug/L
1,1,2-Trichloroethane	ND	1.0	ug/L
Trichloroethene	ND	1.0	ug/L
Vinyl chloride	ND	1.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	106	(73 - 122)
1,2-Dichloroethane-d4	108	(61 - 128)
Toluene-d8	104	(76 - 110)
4-Bromofluorobenzene	85	(74 - 116)

Tetra Tech NUS, Inc

Client Sample ID: NTC22MW06S02

GC/MS Volatiles

Lot-Sample #...:	A5K220298-004	**Work Order #...:**	HQREX1AA	**Matrix.........:**	WG
Date Sampled...:	11/20/05 17:00	**Date Received..:**	11/22/05		
Prep Date......:	12/01/05	**Analysis Date..:**	12/01/05		
Prep Batch #...:	5336244				
Dilution Factor:	1428.6	**Initial Wgt/Vol:**	5 mL	**Final Wgt/Vol..:**	5 mL
		Method.........:	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Carbon tetrachloride	ND	1400	ug/L
Chloroethane	ND	1400	ug/L
Chloromethane	ND	1400	ug/L
1,1-Dichloroethane	ND	1400	ug/L
1,2-Dichloroethane	ND	1400	ug/L
cis-1,2-Dichloroethene	**930 J**	**1400**	**ug/L**
trans-1,2-Dichloroethene	ND	1400	ug/L
1,1-Dichloroethene	ND	1400	ug/L
1,1,1,2-Tetrachloroethane	ND	1400	ug/L
1,1,2,2-Tetrachloroethane	ND	1400	ug/L
Tetrachloroethene	**45000 B**	**1400**	**ug/L**
1,1,1-Trichloroethane	ND	1400	ug/L
1,1,2-Trichloroethane	ND	1400	ug/L
Trichloroethene	**760 J**	**1400**	**ug/L**
Vinyl chloride	ND	1400	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	100	(73 - 122)
1,2-Dichloroethane-d4	104	(61 - 128)
Toluene-d8	106	(76 - 110)
4-Bromofluorobenzene	81	(74 - 116)

NOTE(S):

J Estimated result. Result is less than RL.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

Tetra Tech NUS, Inc

Client Sample ID: NTC22MW10D02

GC/MS Volatiles

Lot-Sample #...: A5K220298-002 **Work Order #...:** HQRER1AA **Matrix.........:** WG
Date Sampled...: 11/20/05 13:30 **Date Received..:** 11/22/05
Prep Date......: 12/01/05 **Analysis Date..:** 12/01/05
Prep Batch #...: 5335104
Dilution Factor: 1 **Initial Wgt/Vol:** 5 mL **Final Wgt/Vol..:** 5 mL
Method.........: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Carbon tetrachloride	ND	1.0	ug/L
Chloroethane	ND	1.0	ug/L
Chloromethane	ND	1.0	ug/L
1,1-Dichloroethane	ND	1.0	ug/L
1,2-Dichloroethane	ND	1.0	ug/L
cis-1,2-Dichloroethene	**4.0**	**1.0**	**ug/L**
trans-1,2-Dichloroethene	**0.38 J**	**1.0**	**ug/L**
1,1-Dichloroethene	ND	1.0	ug/L
1,1,1,2-Tetrachloroethane	ND	1.0	ug/L
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L
Tetrachloroethene	ND	1.0	ug/L
1,1,1-Trichloroethane	ND	1.0	ug/L
1,1,2-Trichloroethane	ND	1.0	ug/L
Trichloroethene	ND	1.0	ug/L
Vinyl chloride	**1.3**	**1.0**	**ug/L**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	103	(73 - 122)
1,2-Dichloroethane-d4	107	(61 - 128)
Toluene-d8	106	(76 - 110)
4-Bromofluorobenzene	84	(74 - 116)

NOTE(S):

J Estimated result. Result is less than RL.

Tetra Tech NUS, Inc

Client Sample ID: NTC22MW10S02

GC/MS Volatiles

Lot-Sample #...: A5K220298-003 **Work Order #...:** HQREV1AA **Matrix.........:** WG
Date Sampled...: 11/20/05 15:00 **Date Received..:** 11/22/05
Prep Date......: 12/01/05 **Analysis Date..:** 12/01/05
Prep Batch #...: 5336244
Dilution Factor: 2 **Initial Wgt/Vol:** 5 mL **Final Wgt/Vol..:** 5 mL
Method.........: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Carbon tetrachloride	ND	2.0	ug/L
Chloroethane	ND	2.0	ug/L
Chloromethane	ND	2.0	ug/L
1,1-Dichloroethane	ND	2.0	ug/L
1,2-Dichloroethane	ND	2.0	ug/L
cis-1,2-Dichloroethene	**52**	**2.0**	**ug/L**
trans-1,2-Dichloroethene	**0.56 J**	**2.0**	**ug/L**
1,1-Dichloroethene	ND	2.0	ug/L
1,1,1,2-Tetrachloroethane	ND	2.0	ug/L
1,1,2,2-Tetrachloroethane	ND	2.0	ug/L
Tetrachloroethene	**3.5 B**	**2.0**	**ug/L**
1,1,1-Trichloroethane	ND	2.0	ug/L
1,1,2-Trichloroethane	ND	2.0	ug/L
Trichloroethene	ND	2.0	ug/L
Vinyl chloride	ND	2.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	106	(73 - 122)
1,2-Dichloroethane-d4	104	(61 - 128)
Toluene-d8	108	(76 - 110)
4-Bromofluorobenzene	85	(74 - 116)

NOTE(S):

J Estimated result. Result is less than RL.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

Tetra Tech NUS, Inc

Client Sample ID: NTC22TB01

GC/MS Volatiles

Lot-Sample #...:	A5K180318-017	**Work Order #...:**	HQKE61AA	**Matrix.........:**	WQ
Date Sampled...:	11/17/05	**Date Received..:**	11/18/05		
Prep Date......:	11/28/05	**Analysis Date..:**	11/28/05		
Prep Batch #...:	5333173				
Dilution Factor:	1	**Initial Wgt/Vol:**	5 mL	**Final Wgt/Vol..:**	5 mL
		Method.........:	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Carbon tetrachloride	ND	1.0	ug/L
Chloroethane	ND	1.0	ug/L
Chloromethane	ND	1.0	ug/L
1,1-Dichloroethane	ND	1.0	ug/L
1,2-Dichloroethane	ND	1.0	ug/L
cis-1,2-Dichloroethene	ND	1.0	ug/L
trans-1,2-Dichloroethene	ND	1.0	ug/L
1,1-Dichloroethene	ND	1.0	ug/L
1,1,1,2-Tetrachloroethane	ND	1.0	ug/L
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L
Tetrachloroethene	ND	1.0	ug/L
1,1,1-Trichloroethane	ND	1.0	ug/L
1,1,2-Trichloroethane	ND	1.0	ug/L
Trichloroethene	ND	1.0	ug/L
Vinyl chloride	ND	1.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	89	(73 - 122)
1,2-Dichloroethane-d4	99	(61 - 128)
Toluene-d8	96	(76 - 110)
4-Bromofluorobenzene	94	(74 - 116)

Tetra Tech NUS, Inc

Client Sample ID: NTC22TB02

GC/MS Volatiles

Lot-Sample #...:	A5K220298-006	**Work Order #...:**	HQRE91AA	**Matrix.........:**	WQ
Date Sampled...:	11/20/05	**Date Received..:**	11/22/05		
Prep Date......:	12/01/05	**Analysis Date..:**	12/01/05		
Prep Batch #...:	5336227				
Dilution Factor:	1	**Initial Wgt/Vol:**	5 mL	**Final Wgt/Vol..:**	5 mL
		Method.........:	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Carbon tetrachloride	ND	1.0	ug/L
Chloroethane	ND	1.0	ug/L
Chloromethane	ND	1.0	ug/L
1,1-Dichloroethane	ND	1.0	ug/L
1,2-Dichloroethane	ND	1.0	ug/L
cis-1,2-Dichloroethene	ND	1.0	ug/L
trans-1,2-Dichloroethene	ND	1.0	ug/L
1,1-Dichloroethene	ND	1.0	ug/L
1,1,1,2-Tetrachloroethane	ND	1.0	ug/L
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L
Tetrachloroethene	**0.98 J**	**1.0**	**ug/L**
1,1,1-Trichloroethane	ND	1.0	ug/L
1,1,2-Trichloroethane	ND	1.0	ug/L
Trichloroethene	ND	1.0	ug/L
Vinyl chloride	ND	1.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	93	(73 - 122)
1,2-Dichloroethane-d4	101	(61 - 128)
Toluene-d8	95	(76 - 110)
4-Bromofluorobenzene	87	(74 - 116)

NOTE(S):

J Estimated result. Result is less than RL.

[redacted]

Chain of Custody Record

STL-4124 (0901)

SEVERN TRENT STL
Severn Trent Laboratories, Inc.

Client	TetraTech NUS
Address	661 Andersen Dr.
City / State / Zip Code	Pittsburgh / PA / 15220
Project Name and Location (State)	NS Great Lakes - Site 22
Contract/Purchase Order/Quote No.	67660
Project Manager	Robert Davis
Telephone Number (Area Code)/Fax Number	(412) 921-7251
Site Contact	Jeff Schubert
Lab Contact	Lois Ezzo
Carrier/Waybill Number	8494-1921-4725
Date	11-17-05
Lab Number	(330) 966-7269
Chain of Custody Number	245250
Page	1 of 2

Analysis (Attach list if more space is needed)

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Air	Aqueous	Sed.	Soil	Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH		C VOCs	Soil moist
NTC22SB200203	11-17-05	2:20				✓								3	1
NTC22SB200506	11-17-05	2:40				✓								3	1
NTC22SB210203	11-17-05	3:15				✓								3	1
NTC22SB210405	11-17-05	3:45				✓								3	1
NTC22SB211112	11-17-05	4:00				✓								3	1
NTC22SB220203	11-17-05	5:00				✓								3	1
NTC22SB220708	11-17-05	5:10				✓								3	1
NTC22SB221112	11-17-05	5:30				✓							9	3	1
NTC22SB230203	11-17-05	1:30				✓								3	1
NTC22SB230102	11-17-05	1:10				✓								3	1
NTC22SB240102	11-17-05	12:30				✓								3	1
NTC22SB240203	11-17-05	12:30				✓								3	1

Special Instructions/ Conditions of Receipt

chlorinated VOC compounds per TtNUS ~~contract~~ purchase order # 1005085, dated 10/21/05 (see Attach. A)

Possible Hazard Identification

☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal

☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required

☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☐ Other____

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished By: Jeffrey P. Schubert	11-17-05	8:30p	1. Received By: Lisa Hines	11-18-05	9:30
2. Relinquished By			2. Received By		
3. Relinquished By			3. Received By		

Comments

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy.

[redacted]

Chain of Custody Record

SEVERN TRENT **STL** Severn Trent Laboratories, Inc.

STL-4124 (0901)

Client: Tetra Tech NUS	Project Manager: Robert Davis	Date: 11-17-05	Chain of Custody Number: 245251
Address: 661 Anderson Dr.	Telephone Number (Area Code)/Fax Number: (412) 921-7251	Lab Number: 330 966 7269	Page 2 of 2
City: Pittsburgh State: PA Zip Code: 15220	Site Contact: Jeff Schubert Lab Contact: Lois Ezzo		
Project Name and Location (State): NS Great Lakes Site 22	Carrier/Waybill Number: 8494-1921-4725		
Contract/Purchase Order/Quote No.: 67660			

Analysis (Attach list if more space is needed): VOCs, Solids

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Air	Aqueous	Sed.	Soil	Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	VOCs	Solids	Special Instructions/ Conditions of Receipt
NTC22SB250102	11-17-05					✓							3		
NTC22SB250203	11-17-05					✓							3		
NTC22FD01	11-17-05					✓							3		⇒ NTC22SB210405
NTC22FD02	11-17-05					✓							3		⇒ NTC22SB221112
NTC22TB01	11-17-05			✓									1		

Possible Hazard Identification: ☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required: ☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☐ Other____

QC Requirements (Specify)

1. Relinquished By: Jeffrey P. Schubert	Date: 11-17-05	Time: 8:30p	1. Received By: Lisa Harries	Date: 11-18-05	Time: 9:30
2. Relinquished By	Date	Time	2. Received By	Date	Time
3. Relinquished By	Date	Time	3. Received By	Date	Time

Comments

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

[redacted]

Chain of Custody Record

SEVERN TRENT **STL**

Severn Trent Laboratories, Inc.

STL-4124 (0901)

Client: Tetra Tech NUS	Project Manager: Robert Davis	Date: 11-20-05	Chain of Custody Number: 245252
Address: 661 Andersen Dr.	Telephone Number (Area Code)/Fax Number: (412) 921-7251	Lab Number: (330) 966-7269	Page 1 of 1
City: Pittsburgh; State: PA; Zip Code: 15220	Site Contact: Jeff Schubert; Lab Contact: Lois Ezzo	Analysis (Attach list if more space is needed): VOCs 8260B	
Project Name and Location (State): NS Great Lakes Site 22	Carrier/Waybill Number: 8494 1921 4298		Special Instructions/ Conditions of Receipt
Contract/Purchase Order/Quote No.: 67060			

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	VOCs 8260B	Special Instructions/ Conditions of Receipt
NTC22MW05S02	11-20-05	11:40		✓						3			✓	
NTC22MW10D02	11-20-05	13:30		✓						3			✓	
NTC22MW10S02	11-20-05	15:00		✓						3			✓	
NTC22MW06S02	11-20-05	17:00		✓						3			✓	06S02 may have elevated VOCs
NTC22FD03	11-20-05			✓						3			✓	NTC22MW06S02
NTC22TB02	11-20-05			✓						1			✓	

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required: ☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☐ Other____

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished By: Jeffrey P. Schubert	11-21-05	2:30 pm	1. Received By: [illegible]	11/22/05	0945
2. Relinquished By			2. Received By		
3. Relinquished By			3. Received By		

Comments

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

JULY 2006

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO:	**MR. B. DAVIS**	**DATE:**	**JANUARY 23, 2007**
FROM:	**EDWARD SEDLMYER**	**COPIES:**	**DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION- VOA**
CTO 009, NTC GREAT LAKES
SDG 6G12170

SAMPLES: 2/Aqueous

TRIP BLANK TRIP BLANK-A

17/Solid

GL95105S120001R	GL95105S120203R	NTC22FD002
NTC22FD01	NTC22MW10D0708R	NTC22MW10D1112R
NTC22SB150001R	NTC22SB151112R	NTC22SB191920R
NTC22SB200203R	NTC22SB200607R	NTC22SB210910R
NTC22SB211314R	NTC22SB220708R	NTC22SB221819R
NTCMW05S0001R	NTCMW06D0708R	

OVERVIEW

The sample set for CTO 009 NTC Great Lakes, SDG 6G12170 consists of, two (2) trip blanks and seventeen (17) soil environmental samples. All samples were analyzed for select volatile organic compounds (VOCs). Two field duplicate pairs were associated with this SDG: NTC22FD01 / NTC22MW10D0708R and NTC22FD002 / NTC22SB191920R.

The samples were collected by TetraTech NUS on July 11 and 12, 2006 and analyzed by Severn Trent Laboratories, Inc., North Canton, OH. All analyses were conducted in accordance with USEPA SW 846 Method 8260B analytical and reporting protocol. The data contained in this SDG were validated with regard to the following parameters:

* • Data Completeness
* • Holding Times
• Initial and Continuing Calibration
• Laboratory Blank Analyses
• Field Duplicate Results
* • Detection Limits

In addition, samples NTC22SB151112R and NTC22SB211314R was also validated with regard to the following parameters:

* • Surrogate Recoveries
* • Blank Spike/Blank Spike Duplicate Results
* • Matrix Spike/Matrix Spike Duplicate Results
* • Internal Standard Recoveries
* • Compound Quantitation
* • Compound Identification

The symbol (*) indicates that quality control criteria were met for this parameter. Problems affecting data quality are discussed below; documentation supporting these findings is presented in Appendix C. Qualified Analytical results are presented in Appendix A. Results as reported by the laboratory are presented in Appendix B.

Volatile

The following compound was detected in the medium level method blank:

Compound	Maximum Concentration	Blank Action Level
Tetrachloroethene(1)	13 µg/kg	65 µg/kg

1- Concentration detected in a method blank associated with QC batch 6197248. Only diluted samples analyzed on this date were evaluated relative to this blank.

No action was taken for blank contamination because the tetrachloroethene concentrations in all associated samples greater than 10X the blank action level.

A continuing calibration had a %D outside the 25% quality control limit on 7/17/06 at 11:20 on instrument A3UX8A for chloroethane. No action was taken on this basis because this is a limited review.

The field duplicate precision exceeded the 50% relative percent difference (RPD) quality control limit for tetrachloroethene in the field duplicate pair NTC22MW10D0708R / NTC22FD01. Positive results for tetrachloroethene in the duplicate samples NTC22MW10D0708R / NTC22FD01 were qualified as estimated (J).

All samples except NTC22SB220708R required a dilution for tetrachloroethene and/or trichloroethene. No qualification of the data was necessary.

Additional Comments:

Positive results less than the reporting limit (RL) were qualified as estimated, J, due to uncertainty near the detection limit.

The laboratory incorrectly transposed a sample ID on the VOA Form I. The sample ID NTCMW05S120001R has been corrected in the database to NTCMW05S10001R.

Detection limits for all samples, except NTC22SB220708R, are elevated due to the medium level preparation procedure. Detection limits for all compounds exceed those listed in the laboratory specification.

EXECUTIVE SUMMARY

Laboratory Performance Issues: Tetrachloroethene was detected in an aqueous laboratory preparation blank.

Other factors affecting data quality: Field duplicate imprecision resulted in qualification of samples NTC22MW10D0708R and NTC22FD01.

The data for these analyses were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation (October 1999) and the Department of Defense (DoD) document entitled "Quality Systems Manual (QSM) for Environmental Laboratories" (January 2006). The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the DoD QSM."

Edward Sedlmyer
Tetra Tech NUS

Edward Sedlmyer
Chemist/Data Validator

TetraTech NUS

Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:

Appendix A – Qualified Analytical Results
Appendix B – Results as Reported by the Laboratory
Appendix C – Support Documentation

APPENDIX A

QUALIFIED ANALYTICAL RESULTS

Data Validation Qualifier Codes:

A	=	Lab Blank Contamination
B	=	Field Blank Contamination
C	=	Calibration Noncompliance (e.g. % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01	=	GC/MS Tuning Noncompliance
D	=	MS/MSD Recovery Noncompliance
E	=	LCS/LCSD Recovery Noncompliance
F	=	Lab Duplicate Imprecision
G	=	Field Duplicate Imprecision
H	=	Holding Time Exceedance
I	=	ICP Serial Dilution Noncompliance
J	=	GFAA PDS - GFAA MSA's r < 0.995 / ICP PDS Recovery Noncompliance
K	=	ICP Interference - includes ICS % R Noncompliance
L	=	Instrument Calibration Range Exceedance
M	=	Sample Preservation Noncompliance
N	=	Internal Standard Noncompliance
N01	=	Internal Standard Recovery Noncompliance Dioxins
N02	=	Recovery Standard Noncompliance Dioxins
N03	=	Clean-up Standard Noncompliance Dioxins
O	=	Poor Instrument Performance (e.g. base-line drifting)
P	=	Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q	=	Other problems (can encompass a number of issues; e.g. chromatography,interferences, etc.)
R	=	Surrogates Recovery Noncompliance
S	=	Pesticide/PCB Resolution
T	=	% Breakdown Noncompliance for DDT and Endrin
U	=	% Difference between columns/detectors >25% for positive results determined via GC/HPLC
V	=	Non-linear calibrations; correlation coefficient r < 0.995
W	=	EMPC result
X	=	Signal to noise response drop
Y	=	Percent solids <30%
Z	=	Uncertainty at 2 sigma deviation is greater than sample activity

PROJ_NO: 00202

SDG: 6G12170 MEDIA: SOIL DATA FRACTION: OV

nsample	GL95105S120001RDL
samp_date	7/11/2006
lab_id	A6G120170004
qc_type	NM
units	UG/KG
Pct_Solids	86.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	750	U	
1,1,1-TRICHLOROETHANE	750	U	
1,1,2,2-TETRACHLOROETHANE	750	U	
1,1,2-TRICHLOROETHANE	750	U	
1,1-DICHLOROETHANE	750	U	
1,1-DICHLOROETHENE	750	U	
1,2-DICHLOROETHANE	750	U	
CARBON TETRACHLORIDE	750	U	
CHLOROETHANE	750	U	
CHLOROMETHANE	750	U	
CIS-1,2-DICHLOROETHENE	170	J	P
TETRACHLOROETHENE	20000		
TRANS-1,2-DICHLOROETHENE	750	U	
TRICHLOROETHENE	410	J	P
VINYL CHLORIDE	750	U	

nsample	GL95105S120203RDL
samp_date	7/11/2006
lab_id	A6G120170005
qc_type	NM
units	UG/KG
Pct_Solids	82.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	880	U	
1,1,1-TRICHLOROETHANE	880	U	
1,1,2,2-TETRACHLOROETHANE	880	U	
1,1,2-TRICHLOROETHANE	880	U	
1,1-DICHLOROETHANE	880	U	
1,1-DICHLOROETHENE	880	U	
1,2-DICHLOROETHANE	880	U	
CARBON TETRACHLORIDE	880	U	
CHLOROETHANE	880	U	
CHLOROMETHANE	880	U	
CIS-1,2-DICHLOROETHENE	58	J	P
TETRACHLOROETHENE	21000		
TRANS-1,2-DICHLOROETHENE	880	U	
TRICHLOROETHENE	100	J	P
VINYL CHLORIDE	880	U	

nsample	NTC22FD002DL
samp_date	7/12/2006
lab_id	A6G130157004
qc_type	NM
units	UG/KG
Pct_Solids	86.0
DUP_OF:	NTC22SB191920R

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	81000	U	
1,1,1-TRICHLOROETHANE	81000	U	
1,1,2,2-TETRACHLOROETHANE	81000	U	
1,1,2-TRICHLOROETHANE	81000	U	
1,1-DICHLOROETHANE	81000	U	
1,1-DICHLOROETHENE	81000	U	
1,2-DICHLOROETHANE	81000	U	
CARBON TETRACHLORIDE	81000	U	
CHLOROETHANE	81000	U	
CHLOROMETHANE	81000	U	
CIS-1,2-DICHLOROETHENE	81000	U	
TETRACHLOROETHENE	2500000		
TRANS-1,2-DICHLOROETHENE	81000	U	
TRICHLOROETHENE	5100	J	P
VINYL CHLORIDE	81000	U	

PROJ_NO: 00202

SDG: 6G12170 MEDIA: SOIL DATA FRACTION: OV

nsample	NTC22FD01DL
samp_date	7/11/2006
lab_id	A6G120170010
qc_type	NM
units	UG/KG
Pct_Solids	79.0
DUP_OF:	NTC22MW10D0708R

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	270	U	
1,1,1-TRICHLOROETHANE	270	U	
1,1,2,2-TETRACHLOROETHANE	270	U	
1,1,2-TRICHLOROETHANE	270	U	
1,1-DICHLOROETHANE	270	U	
1,1-DICHLOROETHENE	270	U	
1,2-DICHLOROETHANE	270	U	
CARBON TETRACHLORIDE	270	U	
CHLOROETHANE	270	U	
CHLOROMETHANE	270	U	
CIS-1,2-DICHLOROETHENE	270	U	
TETRACHLOROETHENE	770	J	G
TRANS-1,2-DICHLOROETHENE	270	U	
TRICHLOROETHENE	270	U	
VINYL CHLORIDE	270	U	

nsample	NTC22MW10D0708RDL
samp_date	7/11/2006
lab_id	A6G120170008
qc_type	NM
units	UG/KG
Pct_Solids	79.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	280	U	
1,1,1-TRICHLOROETHANE	280	U	
1,1,2,2-TETRACHLOROETHANE	280	U	
1,1,2-TRICHLOROETHANE	280	U	
1,1-DICHLOROETHANE	280	U	
1,1-DICHLOROETHENE	280	U	
1,2-DICHLOROETHANE	280	U	
CARBON TETRACHLORIDE	280	U	
CHLOROETHANE	280	U	
CHLOROMETHANE	280	U	
CIS-1,2-DICHLOROETHENE	280	U	
TETRACHLOROETHENE	350	J	G
TRANS-1,2-DICHLOROETHENE	280	U	
TRICHLOROETHENE	280	U	
VINYL CHLORIDE	280	U	

nsample	NTC22MW10D1112RDL
samp_date	7/11/2006
lab_id	A6G120170009
qc_type	NM
units	UG/KG
Pct_Solids	85.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	1200	U	
1,1,1-TRICHLOROETHANE	1200	U	
1,1,2,2-TETRACHLOROETHANE	1200	U	
1,1,2-TRICHLOROETHANE	1200	U	
1,1-DICHLOROETHANE	1200	U	
1,1-DICHLOROETHENE	1200	U	
1,2-DICHLOROETHANE	1200	U	
CARBON TETRACHLORIDE	1200	U	
CHLOROETHANE	1200	U	
CHLOROMETHANE	1200	U	
CIS-1,2-DICHLOROETHENE	1200	U	
TETRACHLOROETHENE	36000		
TRANS-1,2-DICHLOROETHENE	1200	U	
TRICHLOROETHENE	120	J	P
VINYL CHLORIDE	1200	U	

PROJ_NO: 00202

SDG: 6G12170 MEDIA: SOIL DATA FRACTION: OV

nsample	NTC22SB150001RDL
samp_date	7/11/2006
lab_id	A6G120170006
qc_type	NM
units	UG/KG
Pct_Solids	85.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	230	U	
1,1,1-TRICHLOROETHANE	230	U	
1,1,2,2-TETRACHLOROETHANE	230	U	
1,1,2-TRICHLOROETHANE	230	U	
1,1-DICHLOROETHANE	230	U	
1,1-DICHLOROETHENE	230	U	
1,2-DICHLOROETHANE	230	U	
CARBON TETRACHLORIDE	230	U	
CHLOROETHANE	230	U	
CHLOROMETHANE	230	U	
CIS-1,2-DICHLOROETHENE	28	J	P
TETRACHLOROETHENE	3100		
TRANS-1,2-DICHLOROETHENE	230	U	
TRICHLOROETHENE	36	J	P
VINYL CHLORIDE	230	U	

nsample	NTC22SB151112RDL
samp_date	7/11/2006
lab_id	A6G120170007
qc_type	NM
units	UG/KG
Pct_Solids	85.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	10000	U	
1,1,1-TRICHLOROETHANE	10000	U	
1,1,2,2-TETRACHLOROETHANE	10000	U	
1,1,2-TRICHLOROETHANE	10000	U	
1,1-DICHLOROETHANE	10000	U	
1,1-DICHLOROETHENE	10000	U	
1,2-DICHLOROETHANE	10000	U	
CARBON TETRACHLORIDE	10000	U	
CHLOROETHANE	10000	U	
CHLOROMETHANE	10000	U	
CIS-1,2-DICHLOROETHENE	10000	U	
TETRACHLOROETHENE	250000		
TRANS-1,2-DICHLOROETHENE	10000	U	
TRICHLOROETHENE	5300	J	P
VINYL CHLORIDE	10000	U	

nsample	NTC22SB191920RDL
samp_date	7/12/2006
lab_id	A6G130157003
qc_type	NM
units	UG/KG
Pct_Solids	87.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	120000	U	
1,1,1-TRICHLOROETHANE	120000	U	
1,1,2,2-TETRACHLOROETHANE	120000	U	
1,1,2-TRICHLOROETHANE	120000	U	
1,1-DICHLOROETHANE	120000	U	
1,1-DICHLOROETHENE	120000	U	
1,2-DICHLOROETHANE	120000	U	
CARBON TETRACHLORIDE	120000	U	
CHLOROETHANE	120000	U	
CHLOROMETHANE	120000	U	
CIS-1,2-DICHLOROETHENE	120000	U	
TETRACHLOROETHENE	3300000		
TRANS-1,2-DICHLOROETHENE	120000	U	
TRICHLOROETHENE	5700	J	P
VINYL CHLORIDE	120000	U	

PROJ_NO: 00202

SDG: 6G12170 MEDIA: SOIL DATA FRACTION: OV

nsample	NTC22SB200203RDL
samp_date	7/11/2006
lab_id	A6G120170001
qc_type	NM
units	UG/KG
Pct_Solids	89.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	2100	U	
1,1,1-TRICHLOROETHANE	2100	U	
1,1,2,2-TETRACHLOROETHANE	2100	U	
1,1,2-TRICHLOROETHANE	2100	U	
1,1-DICHLOROETHANE	2100	U	
1,1-DICHLOROETHENE	2100	U	
1,2-DICHLOROETHANE	2100	U	
CARBON TETRACHLORIDE	2100	U	
CHLOROETHANE	2100	U	
CHLOROMETHANE	2100	U	
CIS-1,2-DICHLOROETHENE	2100	U	
TETRACHLOROETHENE	58000		
TRANS-1,2-DICHLOROETHENE	2100	U	
TRICHLOROETHENE	160	J	P
VINYL CHLORIDE	2100	U	

nsample	NTC22SB200607RDL
samp_date	7/11/2006
lab_id	A6G120170002
qc_type	NM
units	UG/KG
Pct_Solids	87.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	430	U	
1,1,1-TRICHLOROETHANE	430	U	
1,1,2,2-TETRACHLOROETHANE	430	U	
1,1,2-TRICHLOROETHANE	430	U	
1,1-DICHLOROETHANE	430	U	
1,1-DICHLOROETHENE	430	U	
1,2-DICHLOROETHANE	430	U	
CARBON TETRACHLORIDE	430	U	
CHLOROETHANE	430	U	
CHLOROMETHANE	430	U	
CIS-1,2-DICHLOROETHENE	430	U	
TETRACHLOROETHENE	11000		
TRANS-1,2-DICHLOROETHENE	430	U	
TRICHLOROETHENE	47	J	P
VINYL CHLORIDE	430	U	

nsample	NTC22SB210910RDL
samp_date	7/12/2006
lab_id	A6G130157001
qc_type	NM
units	UG/KG
Pct_Solids	81.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	1700	U	
1,1,1-TRICHLOROETHANE	1700	U	
1,1,2,2-TETRACHLOROETHANE	1700	U	
1,1,2-TRICHLOROETHANE	1700	U	
1,1-DICHLOROETHANE	1700	U	
1,1-DICHLOROETHENE	1700	U	
1,2-DICHLOROETHANE	1700	U	
CARBON TETRACHLORIDE	1700	U	
CHLOROETHANE	1700	U	
CHLOROMETHANE	1700	U	
CIS-1,2-DICHLOROETHENE	1700	U	
TETRACHLOROETHENE	57000		
TRANS-1,2-DICHLOROETHENE	1700	U	
TRICHLOROETHENE	700	J	P
VINYL CHLORIDE	1700	U	

PROJ_NO: 00202

SDG: 6G12170 MEDIA: SOIL DATA FRACTION: OV

nsample	NTC22SB211314RDL
samp_date	7/12/2006
lab_id	A6G130157002
qc_type	NM
units	UG/KG
Pct_Solids	88.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	5700	U	
1,1,1-TRICHLOROETHANE	5700	U	
1,1,2,2-TETRACHLOROETHANE	5700	U	
1,1,2-TRICHLOROETHANE	5700	U	
1,1-DICHLOROETHANE	5700	U	
1,1-DICHLOROETHENE	5700	U	
1,2-DICHLOROETHANE	5700	U	
CARBON TETRACHLORIDE	5700	U	
CHLOROETHANE	5700	U	
CHLOROMETHANE	5700	U	
CIS-1,2-DICHLOROETHENE	5700	U	
TETRACHLOROETHENE	210000		
TRANS-1,2-DICHLOROETHENE	5700	U	
TRICHLOROETHENE	11000		
VINYL CHLORIDE	5700	U	

nsample	NTC22SB220708RDL
samp_date	7/11/2006
lab_id	A6G120170012
qc_type	NM
units	UG/KG
Pct_Solids	77.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	6.3	U	
1,1,1-TRICHLOROETHANE	6.3	U	
1,1,2,2-TETRACHLOROETHANE	6.3	U	
1,1,2-TRICHLOROETHANE	6.3	U	
1,1-DICHLOROETHANE	6.3	U	
1,1-DICHLOROETHENE	6.3	U	
1,2-DICHLOROETHANE	6.3	U	
CARBON TETRACHLORIDE	6.3	U	
CHLOROETHANE	6.3	U	
CHLOROMETHANE	6.3	U	
CIS-1,2-DICHLOROETHENE	6.3	U	
TETRACHLOROETHENE	2.1	J	P
TRANS-1,2-DICHLOROETHENE	6.3	U	
TRICHLOROETHENE	6.3	U	
VINYL CHLORIDE	6.3	U	

nsample	NTC22SB221819RDL
samp_date	7/11/2006
lab_id	A6G120170013
qc_type	NM
units	UG/KG
Pct_Solids	86.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	230	U	
1,1,1-TRICHLOROETHANE	230	U	
1,1,2,2-TETRACHLOROETHANE	230	U	
1,1,2-TRICHLOROETHANE	230	U	
1,1-DICHLOROETHANE	230	U	
1,1-DICHLOROETHENE	230	U	
1,2-DICHLOROETHANE	230	U	
CARBON TETRACHLORIDE	230	U	
CHLOROETHANE	230	U	
CHLOROMETHANE	230	U	
CIS-1,2-DICHLOROETHENE	46	J	P
TETRACHLOROETHENE	260		
TRANS-1,2-DICHLOROETHENE	230	U	
TRICHLOROETHENE	490		
VINYL CHLORIDE	230	U	

PROJ_NO: 00202

SDG: 6G12170 MEDIA: SOIL DATA FRACTION: OV

nsample	NTCMW05S0001RDL
samp_date	7/11/2006
lab_id	A6G120170003
qc_type	NM
units	UG/KG
Pct_Solids	79.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	280	U	
1,1,1-TRICHLOROETHANE	280	U	
1,1,2,2-TETRACHLOROETHANE	280	U	
1,1,2-TRICHLOROETHANE	280	U	
1,1-DICHLOROETHANE	280	U	
1,1-DICHLOROETHENE	280	U	
1,2-DICHLOROETHANE	280	U	
CARBON TETRACHLORIDE	280	U	
CHLOROETHANE	280	U	
CHLOROMETHANE	280	U	
CIS-1,2-DICHLOROETHENE	280	U	
TETRACHLOROETHENE	4500		
TRANS-1,2-DICHLOROETHENE	280	U	
TRICHLOROETHENE	280	U	
VINYL CHLORIDE	280	U	

nsample	NTCMW06D0708RDL
samp_date	7/11/2006
lab_id	A6G120170011
qc_type	NM
units	UG/KG
Pct_Solids	82.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	250	U	
1,1,1-TRICHLOROETHANE	250	U	
1,1,2,2-TETRACHLOROETHANE	250	U	
1,1,2-TRICHLOROETHANE	250	U	
1,1-DICHLOROETHANE	250	U	
1,1-DICHLOROETHENE	250	U	
1,2-DICHLOROETHANE	250	U	
CARBON TETRACHLORIDE	250	U	
CHLOROETHANE	250	U	
CHLOROMETHANE	250	U	
CIS-1,2-DICHLOROETHENE	250	U	
TETRACHLOROETHENE	2500		
TRANS-1,2-DICHLOROETHENE	250	U	
TRICHLOROETHENE	22	J	P
VINYL CHLORIDE	250	U	

nsample	TRIP BLANK
samp_date	7/11/2006
lab_id	A6G120170014
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	1	U	
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2-DICHLOROETHANE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROETHANE	1	U	
CHLOROMETHANE	1	U	
CIS-1,2-DICHLOROETHENE	1	U	
TETRACHLOROETHENE	1	U	
TRANS-1,2-DICHLOROETHENE	1	U	
TRICHLOROETHENE	1	U	
VINYL CHLORIDE	1	U	

PROJ_NO: 00202

SDG: 6G12170 MEDIA: SOIL DATA FRACTION: OV

nsample	TRIP BLANK-A
samp_date	7/12/2006
lab_id	A6G130157005
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	1	U	
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2-DICHLOROETHANE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROETHANE	1	U	
CHLOROMETHANE	1	U	
CIS-1,2-DICHLOROETHENE	1	U	
TETRACHLOROETHENE	1	U	
TRANS-1,2-DICHLOROETHENE	1	U	
TRICHLOROETHENE	1	U	
VINYL CHLORIDE	1	U	

TETRA TECH NUS, INC. CHAIN OF CUSTODY

NUMBER 3794

PAGE 1 OF 1

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PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
112G000202	NS GREAT LAKES	BOB DAVIS	412 921-7251	STL
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
Mark L. Mengel		MARK MENGEL	724-777-0035	4101 SHUFFLE DRIVE NW
		CARRIER/WAYBILL NUMBER		CITY, STATE
		831948771263		NORTH CANTON, OH 44720

STANDARD TAT ☐
RUSH TAT ☒
☐ 24 hr. ☐ 48 hr. ☒ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): P, P

PRESERVATIVE USED

TYPE OF ANALYSIS

DATE YEAR 2006	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	ENCORE (CVOCS)	2OZ PLASTIC (MOISTURE)	COMMENTS
7/11	0830	NTC22SB200203R				SO		4	3	1	
7/11	0835	NTC22SB200607R				SO		4	3	1	
7/11	0900	NTCMW05S0001R				SO		4	3	1	
7/11	0930	GL95105S120001R				SO		4	3	1	
7/11	0935	GL95105S120203R				SO		4	3	1	
7/11	1010	NTC22SB150001R				SO		4	3	1	72 hour Turnaround
7/11	1020	NTC22SB151112R				SO		4	3	1	
7/11	1050	NTC22MW10D0708R				SO		4	3	1	
7/11	1100	NTC22MW10D1112R				SO		4	3	1	
7/11	0000	NTC22FD01				SO		4	3	1	
7/11	1130	NTCMW06D0708R				SO		4	3	1	
7/11	1215	NTC22SB220708R				SO		4	3	1	
7/11	1300	NTC22SB221819R				SO		4	3	1	

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY Mark L. Mengel	7-11-06	1600	1. RECEIVED BY [signature]	7-12-06	9:45
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY		

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

STL North Canton

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TETRA TECH NUS, INC. CHAIN OF CUSTODY NUMBER 2151 PAGE ____ OF ____

PROJECT NO: 600202	FACILITY: NTC GREAT LAKES	PROJECT MANAGER: BOB DAVIS	PHONE NUMBER: 412-921-7251	LABORATORY NAME AND CONTACT: STL
SAMPLERS (SIGNATURE): Mark L. Mengel		FIELD OPERATIONS LEADER: MARK MENGEL	PHONE NUMBER: 724-777-0035	ADDRESS: 4101 SHUFFEL DRIVE NW
		CARRIER/WAYBILL NUMBER: FED EX 831948771296		CITY, STATE: NORTH CANTON, OH 44720

STANDARD TAT ☐
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☒ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): P, P
PRESERVATIVE USED:
TYPE OF ANALYSIS: ENCORE (VOCs); 2 OZ. PLASTIC (MOISTURE)

DATE YEAR 2006	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	ENCORE (VOCs)	2 OZ. PLASTIC (MOISTURE)						COMMENTS
7/12	0815	NTC22SB210910 R				SO		4	3	1						
7/12	0820	NTC22SB211314 R				SO		4	3	1						
7/12	1105	NTC22SB191920 R				SO		4	3	1						72 hour
7/12	0000	NTC22 FD002				SO		4	3	1						TURN AROUND

1. RELINQUISHED BY Mark L. Mengel	DATE 7/12/06	TIME 1500	1. RECEIVED BY Lisa Harris	DATE 7-13-06	TIME 9:20
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

STL North Canton

AUGUST 2006

Tetra Tech NUS

INTERNAL CORRESPONDENCE

TO:	MR. B. DAVIS	DATE:	JANUARY 23, 2007
FROM:	EDWARD SEDLMYER	COPIES:	DV FILE

SUBJECT: **ORGANIC DATA VALIDATION- VOA**
CTO 009, NTC GREAT LAKES
SDG 6H09143

SAMPLES: 1/Aqueous

TRIP BLANK-6H09143

6/Solid

NTC22SB151112R1	NTC22SB191920R1	NTC22SB200203R1
NTC22SB210910R1	NTC22SB211314R1	NTCFD01

OVERVIEW

The sample set for CTO 009 NTC Great Lakes, SDG 6H09143 consists of, one (1) trip blank and six (6) soil environmental samples. All samples were analyzed for select volatile organic compounds (VOCs). One field duplicate pair was associated with this SDG: NTCFD01 / NTC22SB191920R1.

The samples were collected by TetraTech NUS on August 7 and 8, 2006 and analyzed by Severn Trent Laboratories, Inc., North Canton, OH. All analyses were conducted in accordance with USEPA SW 846 Method 8260B analytical and reporting protocol. The data contained in this SDG were validated with regard to the following parameters:

* • Data Completeness
* • Holding Times
* • Initial and Continuing Calibration
* • Laboratory Blank Analyses
* • Field Duplicate Results
* • Detection Limits

In addition, sample NTC22SB191920R1 was also validated with regard to the following parameters:

* • Surrogate Recoveries
* • Blank Spike/Blank Spike Duplicate Results
* • Matrix Spike/Matrix Spike Duplicate Results
* • Internal Standard Recoveries
* • Compound Quantitation
* • Compound Identification

The symbol (*) indicates that quality control criteria were met for this parameter. Problems affecting data quality are discussed below; documentation supporting these findings is presented in Appendix C. Qualified Analytical results are presented in Appendix A. Results as reported by the laboratory are presented in Appendix B.

Volatile

All samples except NTC22SB200203R required a dilution for tetrachloroethene and/or trichloroethene. No qualification of the data was necessary.

Additional Comments:

Positive results less than the reporting limit (RL) were qualified as estimated, J, due to uncertainty near the detection limit.

Detection limits for all samples, except NTC22SB200203R, are elevated due to the medium level preparation procedure. Detection limits for all compounds exceed those listed in the laboratory specification.

EXECUTIVE SUMMARY

Laboratory Performance Issues: None.

Other factors affecting data quality: None.

The data for these analyses were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation (October 1999) and the Department of Defense (DoD) document entitled "Quality Systems Manual (QSM) for Environmental Laboratories" (January 2006). The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the DoD QSM."

Edward Sedlmyer

Tetra Tech NUS

Edward Sedlmyer
Chemist/Data Validator

Joseph C. Samchuck

Tetra Tech NUS

Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:

Appendix A – Qualified Analytical Results
Appendix B – Results as Reported by the Laboratory
Appendix C – Support Documentation

APPENDIX A

QUALIFIED ANALYTICAL RESULTS

PROJ_NO: 00202

SDG: 6H09143 MEDIA: SOIL DATA FRACTION: OV

nsample	NTC22SB151112R1DL
samp_date	8/7/2006
lab_id	A6H090143002
qc_type	NM
units	UG/KG
Pct_Solids	80.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	510	U	
1,1,1-TRICHLOROETHANE	510	U	
1,1,2,2-TETRACHLOROETHANE	510	U	
1,1,2-TRICHLOROETHANE	510	U	
1,1-DICHLOROETHANE	510	U	
1,1-DICHLOROETHENE	510	U	
1,2-DICHLOROETHANE	510	U	
CARBON TETRACHLORIDE	510	U	
CHLOROETHANE	510	U	
CHLOROMETHANE	510	U	
CIS-1,2-DICHLOROETHENE	510	U	
TETRACHLOROETHENE	15000		
TRANS-1,2-DICHLOROETHENE	510	U	
TRICHLOROETHENE	200	J	P
VINYL CHLORIDE	510	U	

nsample	NTC22SB191920R1DL
samp_date	8/8/2006
lab_id	A6H090143005
qc_type	NM
units	UG/KG
Pct_Solids	88.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	46000	U	
1,1,1-TRICHLOROETHANE	46000	U	
1,1,2,2-TETRACHLOROETHANE	46000	U	
1,1,2-TRICHLOROETHANE	46000	U	
1,1-DICHLOROETHANE	46000	U	
1,1-DICHLOROETHENE	46000	U	
1,2-DICHLOROETHANE	46000	U	
CARBON TETRACHLORIDE	46000	U	
CHLOROETHANE	46000	U	
CHLOROMETHANE	46000	U	
CIS-1,2-DICHLOROETHENE	46000	U	
TETRACHLOROETHENE	1000000		
TRANS-1,2-DICHLOROETHENE	46000	U	
TRICHLOROETHENE	33000	J	P
VINYL CHLORIDE	46000	U	

nsample	NTC22SB200203R1DL
samp_date	8/7/2006
lab_id	A6H090143001
qc_type	NM
units	UG/KG
Pct_Solids	83.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	5.2	U	
1,1,1-TRICHLOROETHANE	5.2	U	
1,1,2,2-TETRACHLOROETHANE	5.2	U	
1,1,2-TRICHLOROETHANE	5.2	U	
1,1-DICHLOROETHANE	5.2	U	
1,1-DICHLOROETHENE	5.2	U	
1,2-DICHLOROETHANE	5.2	U	
CARBON TETRACHLORIDE	5.2	U	
CHLOROETHANE	5.2	U	
CHLOROMETHANE	5.2	U	
CIS-1,2-DICHLOROETHENE	5.2	U	
TETRACHLOROETHENE	0.91	J	P
TRANS-1,2-DICHLOROETHENE	5.2	U	
TRICHLOROETHENE	5.2	U	
VINYL CHLORIDE	5.2	U	

PROJ_NO: 00202

SDG: 6H09143 MEDIA: SOIL DATA FRACTION: OV

nsample	NTC22SB210910R1DL
samp_date	8/7/2006
lab_id	A6H090143003
qc_type	NM
units	UG/KG
Pct_Solids	90.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	230	U	
1,1,1-TRICHLOROETHANE	230	U	
1,1,2,2-TETRACHLOROETHANE	230	U	
1,1,2-TRICHLOROETHANE	230	U	
1,1-DICHLOROETHANE	230	U	
1,1-DICHLOROETHENE	230	U	
1,2-DICHLOROETHANE	230	U	
CARBON TETRACHLORIDE	230	U	
CHLOROETHANE	230	U	
CHLOROMETHANE	230	U	
CIS-1,2-DICHLOROETHENE	230	U	
TETRACHLOROETHENE	920		
TRANS-1,2-DICHLOROETHENE	230	U	
TRICHLOROETHENE	230	U	
VINYL CHLORIDE	230	U	

nsample	NTC22SB211314R1DL
samp_date	8/7/2006
lab_id	A6H090143004
qc_type	NM
units	UG/KG
Pct_Solids	89.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	220	U	
1,1,1-TRICHLOROETHANE	220	U	
1,1,2,2-TETRACHLOROETHANE	220	U	
1,1,2-TRICHLOROETHANE	220	U	
1,1-DICHLOROETHANE	220	U	
1,1-DICHLOROETHENE	220	U	
1,2-DICHLOROETHANE	220	U	
CARBON TETRACHLORIDE	220	U	
CHLOROETHANE	220	U	
CHLOROMETHANE	220	U	
CIS-1,2-DICHLOROETHENE	220	U	
TETRACHLOROETHENE	560		
TRANS-1,2-DICHLOROETHENE	220	U	
TRICHLOROETHENE	220		
VINYL CHLORIDE	220	U	

nsample	NTCFD01DL
samp_date	8/8/2006
lab_id	A6H090143006
qc_type	NM
units	UG/KG
Pct_Solids	88.0
DUP_OF:	NTC22SB191920R1

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	44000	U	
1,1,1-TRICHLOROETHANE	44000	U	
1,1,2,2-TETRACHLOROETHANE	44000	U	
1,1,2-TRICHLOROETHANE	44000	U	
1,1-DICHLOROETHANE	44000	U	
1,1-DICHLOROETHENE	44000	U	
1,2-DICHLOROETHANE	44000	U	
CARBON TETRACHLORIDE	44000	U	
CHLOROETHANE	44000	U	
CHLOROMETHANE	44000	U	
CIS-1,2-DICHLOROETHENE	44000	U	
TETRACHLOROETHENE	1400000		
TRANS-1,2-DICHLOROETHENE	44000	U	
TRICHLOROETHENE	44000		
VINYL CHLORIDE	44000	U	

PROJ_NO: 00202

SDG: 6H09143 MEDIA: SOIL DATA FRACTION: OV

nsample	TRIP BLANK-6H09143
samp_date	8/8/2006
lab_id	A6H090143007
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	1	U	
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2-DICHLOROETHANE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROETHANE	1	U	
CHLOROMETHANE	1	U	
CIS-1,2-DICHLOROETHENE	1	U	
TETRACHLOROETHENE	1	U	
TRANS-1,2-DICHLOROETHENE	1	U	
TRICHLOROETHENE	1	U	
VINYL CHLORIDE	1	U	

Chain of Custody Record

STL-4124 (0901)

SEVERN TRENT STL
Severn Trent Laboratories, Inc.

14

Client	NS GREAT LAKES
Project Manager	BOB DAVIS
Date	8/8/06
Chain of Custody Number	307443
Address	
Telephone Number (Area Code)/Fax Number	412 921-7251
Lab Number	
Page	1 of 1
City	
State	
Zip Code	
Site Contact	MARK MENGEL
Lab Contact	LOIS EZZO
Project Name and Location (State)	NTC 22
Carrier/Waybill Number	FED EX# 8545 6732 5556
Contract/Purchase Order/Quote No.	

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil		Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH		Analysis: ENCORE - CVOC	MOISTURE	Special Instructions/ Conditions of Receipt
NTC22SB200203R1	8-7-06	1415				X		X							3	1	
NTC22SB151112R1	8-7-06	1505				X		X							3	1	
NTC22SB210910R1	8-7-06	1620				X		X							3	1	72 HOUR TURNAROUND
NTC22SB211314R1	8-7-06	1630				X		X							3	1	
NTC22SB191920R1	8-8-06	0850				X		X							3	1	
NTCFD01	8-8-06	0000				X		X							3		

Possible Hazard Identification: ☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☒ Disposal By Lab ☐ Archive For ______ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required: ☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☒ Other 72-hour

QC Requirements (Specify)

		Date	Time			Date	Time
1. Relinquished By	Mark L. Mengel	8-8-08	1200	1. Received By	[signature]	8-9-06	9:20
2. Relinquished By				2. Received By			
3. Relinquished By				3. Received By			

Comments

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

STL North Canton

SEPTEMBER 2006

Tetra Tech NUS

INTERNAL CORRESPONDENCE

TO: MR. B. DAVIS

DATE: JANUARY 23, 2007

FROM: EDWARD SEDLMYER

COPIES: DV FILE

SUBJECT: ORGANIC DATA VALIDATION- VOA
CTO 009, NTC GREAT LAKES
SDG 6I13153

SAMPLES: 17/Solid

GL95105S0001R2	GL95105S0203R2	NTL22FD001
NTC22FD002	NTC22MW06D0708R2	NTC22MW10D0708R2
NTC22MW10D1112R2	NTC22SB150001R2	NTC22SB151112R2
NTC22SB191920R2	NTC22SB200203R2	NTC22SB200607R2
NTC22SB210910R2	NTC22SB211314R2	NTC22SB220708R2
NTCSB221819R2	NTCMW05S0001R2	

OVERVIEW

The sample set for CTO 009 NTC Great Lakes, SDG 6I13153 consists of, seventeen (17) soil environmental samples. All samples were analyzed for select volatile organic compounds (VOCs). Two field duplicate pairs were associated with this SDG: NTC22FD001 / NTC22MW06D0708R2 and NTC22FD002 / NTC22SB191920R2.

The samples were collected by TetraTech NUS on September 12 and 13, 2006 and analyzed by Severn Trent Laboratories, Inc., North Canton, OH. All analyses were conducted in accordance with USEPA SW 846 Method 8260B analytical and reporting protocol. The data contained in this SDG were validated with regard to the following parameters:

- * Data Completeness
- * Holding Times
- * Initial and Continuing Calibration
- * Laboratory Blank Analyses
- Field Duplicate Results
- * Detection Limits

In addition, samples GL95105S0001R2 and NTL22SB191920R2 were also validated with regard to the following parameters:

- Surrogate Recoveries
- * Blank Spike/Blank Spike Duplicate Results
- * Matrix Spike/Matrix Spike Duplicate Results
- Internal Standard Recoveries
- * Compound Quantitation
- * Compound Identification

The symbol (*) indicates that quality control criteria were met for this parameter. Problems affecting data quality are discussed below; documentation supporting these findings is presented in Appendix C. Qualified Analytical results are presented in Appendix A. Results as reported by the laboratory are presented in Appendix B.

Volatile

The surrogate dibromofluoromethane had percent recoveries less than the quality control limit for the matrix spike / matrix spike duplicate (MS/MSD) associated with batch A6I130153. No action was taken on this basis because the MS/MSD sample was not a TetraTech sample.

The surrogate 4-bromofluorobenzene had a percent recovery less than the quality control limit for sample NTC22SB191920R2. The positive and non-detected results for sample NTC22SB191920R2 were qualified as estimated (J) and (UJ), respectively.

The internal standard 1,4-dichlorobenzene-d4 had low area counts for samples NTC22SB191920R2 and NTC22FD002. The non-detected result for 1,1,2,2-tetrachloroethane in sample NTC22SB191920R2 was qualified as estimated (UJ). No action was taken on sample NTC22FD002 because this is a limited review.

The MS/MSD performed on sample NTC22SB151112R2 had a percent recovery greater than the quality control limit for trichloroethene in the MS and less than the quality control limit in the MSD. In addition, the relative percent difference exceeded the quality control limit. No action was taken on this basis because only a limited review was performed on this sample and the amount spiked was greater than 2 times the sample concentration.

The field duplicate precision exceeded the 50% relative percent difference (RPD) quality control limit for cis-1,2-dichloroethene, tetrachloroethene, and trichloroethene in the field duplicate pair NTC22MW06D0708R2 / NTC22FD001. Sample NTC22MW06D0708R2 was analyzed as a low level soil and sample NTC22FD001 was analyzed as a medium level soil. Positive results for the aforementioned compounds in the duplicate samples NTC22MW06D0708R2 / NTC22FD001 were qualified as estimated (J).

All samples except NTC22FD002, NTC22MW06D0708R2, NTC22MW10D0708R2, NTC22SB150001R2, NTC22SB191920R2, and NTC22SB220708R2 required dilutions for tetrachloroethane and/or trichloroethene.

Additional Comments:

Positive results less than the reporting limit (RL) were qualified as estimated, J, due to uncertainty near the detection limit.

Detection limits for all samples, except NTC22FD002, NTC22MW06D0708R2, NTC22MW10D0708R2, NTC22SB150001R2, NTC22SB191920R2, and NTC22SB220708R2 are elevated due to the medium level preparation procedure. Detection limits for all compounds exceed those listed in the laboratory specification.

EXECUTIVE SUMMARY

Laboratory Performance Issues: None.

Other factors affecting data quality: Field duplicate imprecision resulted in qualification of the data. Surrogate and internal standard non-compliances resulted in qualification of the data for one sample.

The data for these analyses were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation (October 1999) and the Department of Defense (DoD) document entitled "Quality Systems Manual (QSM) for Environmental Laboratories" (January 2006). The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the DoD QSM."

Edward Sedlmyer

Tetra Tech NUS

Edward Sedlmyer
Chemist/Data Validator

TetraTech NUS

Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:

Appendix A – Qualified Analytical Results
Appendix B – Results as Reported by the Laboratory
Appendix C – Support Documentation

APPENDIX A

QUALIFIED ANALYTICAL RESULTS

Data Validation Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration Noncompliance (e.g. % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01 = GC/MS Tuning Noncompliance
D = MS/MSD Recovery Noncompliance
E = LCS/LCSD Recovery Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS - GFAA MSA's r < 0.995 / ICP PDS Recovery Noncompliance
K = ICP Interference - includes ICS % R Noncompliance
L = Instrument Calibration Range Exceedance
M = Sample Preservation Noncompliance
N = Internal Standard Noncompliance
N01 = Internal Standard Recovery Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (e.g. base-line drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues; e.g. chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = % Difference between columns/detectors >25% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient r < 0.995
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 sigma deviation is greater than sample activity

PROJ_NO: 00202

SDG: 6I13153 MEDIA: SOIL DATA FRACTION: OV

nsample	GL95105S0001R2DL
samp_date	9/12/2006
lab_id	A6I130153004
qc_type	NM
units	UG/KG
Pct_Solids	86.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	700	U	
1,1,1-TRICHLOROETHANE	700	U	
1,1,2,2-TETRACHLOROETHANE	700	U	
1,1,2-TRICHLOROETHANE	700	U	
1,1-DICHLOROETHANE	700	U	
1,1-DICHLOROETHENE	700	U	
1,2-DICHLOROETHANE	700	U	
CARBON TETRACHLORIDE	700	U	
CHLOROETHANE	700	U	
CHLOROMETHANE	700	U	
CIS-1,2-DICHLOROETHENE	110	J	P
TETRACHLOROETHENE	19000		
TRANS-1,2-DICHLOROETHENE	700	U	
TRICHLOROETHENE	200	J	P
VINYL CHLORIDE	700	U	

nsample	GL95105S0203R2
samp_date	9/12/2006
lab_id	A6I130153005
qc_type	NM
units	UG/KG
Pct_Solids	82.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	300	U	
1,1,1-TRICHLOROETHANE	300	U	
1,1,2,2-TETRACHLOROETHANE	300	U	
1,1,2-TRICHLOROETHANE	300	U	
1,1-DICHLOROETHANE	300	U	
1,1-DICHLOROETHENE	300	U	
1,2-DICHLOROETHANE	300	U	
CARBON TETRACHLORIDE	300	U	
CHLOROETHANE	300	U	
CHLOROMETHANE	300	U	
CIS-1,2-DICHLOROETHENE	300	U	
TETRACHLOROETHENE	3200		
TRANS-1,2-DICHLOROETHENE	300	U	
TRICHLOROETHENE	30	J	P
VINYL CHLORIDE	300	U	

nsample	NTC22FD001DL
samp_date	9/12/2006
lab_id	A6I130153011
qc_type	NM
units	UG/KG
Pct_Solids	81.0
DUP_OF:	NTC22MW06D0708R2

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	270	U	
1,1,1-TRICHLOROETHANE	270	U	
1,1,2,2-TETRACHLOROETHANE	270	U	
1,1,2-TRICHLOROETHANE	270	U	
1,1-DICHLOROETHANE	270	U	
1,1-DICHLOROETHENE	270	U	
1,2-DICHLOROETHANE	270	U	
CARBON TETRACHLORIDE	270	U	
CHLOROETHANE	270	U	
CHLOROMETHANE	270	U	
CIS-1,2-DICHLOROETHENE	180	J	GP
TETRACHLOROETHENE	1100	J	G
TRANS-1,2-DICHLOROETHENE	270	U	
TRICHLOROETHENE	26	J	GP
VINYL CHLORIDE	270	U	

PROJ_NO: 00202

SDG: 6I13153 MEDIA: SOIL DATA FRACTION: OV

nsample	NTC22FD002DL-RE
samp_date	9/13/2006
lab_id	A6I140268006
qc_type	NM
units	UG/KG
Pct_Solids	84.0
DUP_OF:	NTC22SB191920R2

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	4.8	U	
1,1,1-TRICHLOROETHANE	4.8	U	
1,1,2,2-TETRACHLOROETHANE	4.8	U	
1,1,2-TRICHLOROETHANE	4.8	U	
1,1-DICHLOROETHANE	4.8	U	
1,1-DICHLOROETHENE	4.8	U	
1,2-DICHLOROETHANE	4.8	U	
CARBON TETRACHLORIDE	4.8	U	
CHLOROETHANE	4.8	U	
CHLOROMETHANE	4.8	U	
CIS-1,2-DICHLOROETHENE	2.5	J	P
TETRACHLOROETHENE	4.8	U	
TRANS-1,2-DICHLOROETHENE	4.8	U	
TRICHLOROETHENE	0.86	J	P
VINYL CHLORIDE	4.8	U	

nsample	NTC22MW06D0708R2DL
samp_date	9/12/2006
lab_id	A6I130153010
qc_type	NM
units	UG/KG
Pct_Solids	81.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	5.1	U	
1,1,1-TRICHLOROETHANE	5.1	U	
1,1,2,2-TETRACHLOROETHANE	5.1	U	
1,1,2-TRICHLOROETHANE	5.1	U	
1,1-DICHLOROETHANE	5.1	U	
1,1-DICHLOROETHENE	5.1	U	
1,2-DICHLOROETHANE	5.1	U	
CARBON TETRACHLORIDE	5.1	U	
CHLOROETHANE	5.1	U	
CHLOROMETHANE	5.1	U	
CIS-1,2-DICHLOROETHENE	89	J	G
TETRACHLOROETHENE	170	J	G
TRANS-1,2-DICHLOROETHENE	2.7	J	P
TRICHLOROETHENE	5.6	J	G
VINYL CHLORIDE	5.1	U	

nsample	NTC22MW10D0708R2DL
samp_date	9/12/2006
lab_id	A6I130153008
qc_type	NM
units	UG/KG
Pct_Solids	80.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	6	U	
1,1,1-TRICHLOROETHANE	6	U	
1,1,2,2-TETRACHLOROETHANE	6	U	
1,1,2-TRICHLOROETHANE	6	U	
1,1-DICHLOROETHANE	6	U	
1,1-DICHLOROETHENE	6	U	
1,2-DICHLOROETHANE	6	U	
CARBON TETRACHLORIDE	6	U	
CHLOROETHANE	6	U	
CHLOROMETHANE	6	U	
CIS-1,2-DICHLOROETHENE	6	U	
TETRACHLOROETHENE	3.5	J	P
TRANS-1,2-DICHLOROETHENE	6	U	
TRICHLOROETHENE	0.55	J	P
VINYL CHLORIDE	6	U	

nsample	NTC22MW10D1112R2DL
samp_date	9/12/2006
lab_id	A6I130153009
qc_type	NM
units	UG/KG
Pct_Solids	90.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	5000	U	
1,1,1-TRICHLOROETHANE	5000	U	
1,1,2,2-TETRACHLOROETHANE	5000	U	
1,1,2-TRICHLOROETHANE	5000	U	
1,1-DICHLOROETHANE	5000	U	
1,1-DICHLOROETHENE	5000	U	
1,2-DICHLOROETHANE	5000	U	
CARBON TETRACHLORIDE	5000	U	
CHLOROETHANE	5000	U	
CHLOROMETHANE	5000	U	
CIS-1,2-DICHLOROETHENE	5000	U	
TETRACHLOROETHENE	190000		
TRANS-1,2-DICHLOROETHENE	5000	U	
TRICHLOROETHENE	2200	J	P
VINYL CHLORIDE	5000	U	

nsample	NTC22SB150001R2DL
samp_date	9/12/2006
lab_id	A6I130153006
qc_type	NM
units	UG/KG
Pct_Solids	88.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	5	U	
1,1,1-TRICHLOROETHANE	5	U	
1,1,2,2-TETRACHLOROETHANE	5	U	
1,1,2-TRICHLOROETHANE	5	U	
1,1-DICHLOROETHANE	5	U	
1,1-DICHLOROETHENE	1.1	J	P
1,2-DICHLOROETHANE	5	U	
CARBON TETRACHLORIDE	5	U	
CHLOROETHANE	5	U	
CHLOROMETHANE	5	U	
CIS-1,2-DICHLOROETHENE	170		
TETRACHLOROETHENE	5.3		
TRANS-1,2-DICHLOROETHENE	8		
TRICHLOROETHENE	39		
VINYL CHLORIDE	0.48	J	P

nsample	NTC22SB151112R2DL
samp_date	9/12/2006
lab_id	A6I130153007
qc_type	NM
units	UG/KG
Pct_Solids	87.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	2600	U	
1,1,1-TRICHLOROETHANE	2600	U	
1,1,2,2-TETRACHLOROETHANE	2600	U	
1,1,2-TRICHLOROETHANE	2600	U	
1,1-DICHLOROETHANE	2600	U	
1,1-DICHLOROETHENE	2600	U	
1,2-DICHLOROETHANE	2600	U	
CARBON TETRACHLORIDE	2600	U	
CHLOROETHANE	2600	U	
CHLOROMETHANE	2600	U	
CIS-1,2-DICHLOROETHENE	2600	U	
TETRACHLOROETHENE	92000		
TRANS-1,2-DICHLOROETHENE	2600	U	
TRICHLOROETHENE	2100	J	P
VINYL CHLORIDE	2600	U	

PROJ_NO: 00202

SDG: 6I13153 MEDIA: SOIL DATA FRACTION: OV

nsample	NTC22SB191920R2DL
samp_date	9/13/2006
lab_id	A6I140268005
qc_type	NM
units	UG/KG
Pct_Solids	90.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	4.6	UJ	R
1,1,1-TRICHLOROETHANE	4.6	UJ	R
1,1,2,2-TETRACHLOROETHANE	4.6	UJ	NR
1,1,2-TRICHLOROETHANE	4.6	UJ	R
1,1-DICHLOROETHANE	4.6	UJ	R
1,1-DICHLOROETHENE	4.6	UJ	R
1,2-DICHLOROETHANE	4.6	UJ	R
CARBON TETRACHLORIDE	4.6	UJ	R
CHLOROETHANE	4.6	UJ	R
CHLOROMETHANE	4.6	UJ	R
CIS-1,2-DICHLOROETHENE	3.5	J	PR
TETRACHLOROETHENE	4.6	UJ	R
TRANS-1,2-DICHLOROETHENE	4.6	UJ	R
TRICHLOROETHENE	1.4	J	PR
VINYL CHLORIDE	4.6	UJ	R

nsample	NTC22SB200203R2DL
samp_date	9/12/2006
lab_id	A6I130153001
qc_type	NM
units	UG/KG
Pct_Solids	84.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	280	U	
1,1,1-TRICHLOROETHANE	280	U	
1,1,2,2-TETRACHLOROETHANE	280	U	
1,1,2-TRICHLOROETHANE	280	U	
1,1-DICHLOROETHANE	280	U	
1,1-DICHLOROETHENE	280	U	
1,2-DICHLOROETHANE	280	U	
CARBON TETRACHLORIDE	280	U	
CHLOROETHANE	280	U	
CHLOROMETHANE	280	U	
CIS-1,2-DICHLOROETHENE	280	U	
TETRACHLOROETHENE	1100		
TRANS-1,2-DICHLOROETHENE	280	U	
TRICHLOROETHENE	280	U	
VINYL CHLORIDE	280	U	

nsample	NTC22SB200607R2DL
samp_date	9/12/2006
lab_id	A6I130153002
qc_type	NM
units	UG/KG
Pct_Solids	89.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	240	U	
1,1,1-TRICHLOROETHANE	240	U	
1,1,2,2-TETRACHLOROETHANE	240	U	
1,1,2-TRICHLOROETHANE	240	U	
1,1-DICHLOROETHANE	240	U	
1,1-DICHLOROETHENE	240	U	
1,2-DICHLOROETHANE	240	U	
CARBON TETRACHLORIDE	240	U	
CHLOROETHANE	240	U	
CHLOROMETHANE	240	U	
CIS-1,2-DICHLOROETHENE	240	U	
TETRACHLOROETHENE	3300		
TRANS-1,2-DICHLOROETHENE	240	U	
TRICHLOROETHENE	91	J	P
VINYL CHLORIDE	240	U	

PROJ_NO: 00202

SDG: 6I13153 MEDIA: SOIL DATA FRACTION: OV

nsample	NTC22SB210910R2DL
samp_date	9/13/2006
lab_id	A6I140268001
qc_type	NM
units	UG/KG
Pct_Solids	83.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	240	U	
1,1,1-TRICHLOROETHANE	240	U	
1,1,2,2-TETRACHLOROETHANE	240	U	
1,1,2-TRICHLOROETHANE	240	U	
1,1-DICHLOROETHANE	240	U	
1,1-DICHLOROETHENE	240	U	
1,2-DICHLOROETHANE	240	U	
CARBON TETRACHLORIDE	240	U	
CHLOROETHANE	240	U	
CHLOROMETHANE	240	U	
CIS-1,2-DICHLOROETHENE	240	U	
TETRACHLOROETHENE	420		
TRANS-1,2-DICHLOROETHENE	240	U	
TRICHLOROETHENE	240	U	
VINYL CHLORIDE	240	U	

nsample	NTC22SB211314R2DL
samp_date	9/13/2006
lab_id	A6I140268002
qc_type	NM
units	UG/KG
Pct_Solids	86.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	210	U	
1,1,1-TRICHLOROETHANE	210	U	
1,1,2,2-TETRACHLOROETHANE	210	U	
1,1,2-TRICHLOROETHANE	210	U	
1,1-DICHLOROETHANE	210	U	
1,1-DICHLOROETHENE	210	U	
1,2-DICHLOROETHANE	210	U	
CARBON TETRACHLORIDE	210	U	
CHLOROETHANE	210	U	
CHLOROMETHANE	210	U	
CIS-1,2-DICHLOROETHENE	250		
TETRACHLOROETHENE	760		
TRANS-1,2-DICHLOROETHENE	210	U	
TRICHLOROETHENE	360		
VINYL CHLORIDE	210	U	

nsample	NTC22SB220708R2DL
samp_date	9/13/2006
lab_id	A6I140268003
qc_type	NM
units	UG/KG
Pct_Solids	79.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	5.4	U	
1,1,1-TRICHLOROETHANE	5.4	U	
1,1,2,2-TETRACHLOROETHANE	5.4	U	
1,1,2-TRICHLOROETHANE	5.4	U	
1,1-DICHLOROETHANE	5.4	U	
1,1-DICHLOROETHENE	5.4	U	
1,2-DICHLOROETHANE	5.4	U	
CARBON TETRACHLORIDE	5.4	U	
CHLOROETHANE	5.4	U	
CHLOROMETHANE	5.4	U	
CIS-1,2-DICHLOROETHENE	5.4	U	
TETRACHLOROETHENE	5.4	U	
TRANS-1,2-DICHLOROETHENE	5.4	U	
TRICHLOROETHENE	5.4	U	
VINYL CHLORIDE	5.4	U	

PROJ_NO: 00202

SDG: 6I13153 MEDIA: SOIL DATA FRACTION: OV

nsample	NTC22SB221819R2DL
samp_date	9/13/2006
lab_id	A6I140268004
qc_type	NM
units	UG/KG
Pct_Solids	85.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	1500	U	
1,1,1-TRICHLOROETHANE	1500	U	
1,1,2,2-TETRACHLOROETHANE	1500	U	
1,1,2-TRICHLOROETHANE	1500	U	
1,1-DICHLOROETHANE	1500	U	
1,1-DICHLOROETHENE	1500	U	
1,2-DICHLOROETHANE	1500	U	
CARBON TETRACHLORIDE	1500	U	
CHLOROETHANE	1500	U	
CHLOROMETHANE	1500	U	
CIS-1,2-DICHLOROETHENE	1500	U	
TETRACHLOROETHENE	60000		
TRANS-1,2-DICHLOROETHENE	1500	U	
TRICHLOROETHENE	2400		
VINYL CHLORIDE	1500	U	

nsample	NTCMW05S0001R2DL
samp_date	9/12/2006
lab_id	A6I130153003
qc_type	NM
units	UG/KG
Pct_Solids	84.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	230	U	
1,1,1-TRICHLOROETHANE	230	U	
1,1,2,2-TETRACHLOROETHANE	230	U	
1,1,2-TRICHLOROETHANE	230	U	
1,1-DICHLOROETHANE	230	U	
1,1-DICHLOROETHENE	230	U	
1,2-DICHLOROETHANE	230	U	
CARBON TETRACHLORIDE	230	U	
CHLOROETHANE	230	U	
CHLOROMETHANE	230	U	
CIS-1,2-DICHLOROETHENE	230	U	
TETRACHLOROETHENE	640		
TRANS-1,2-DICHLOROETHENE	230	U	
TRICHLOROETHENE	230	U	
VINYL CHLORIDE	230	U	

Chain of Custody Record

SEVERN TRENT **STL**

Severn Trent Laboratories, Inc.

STL-4124 (0901)

Client: TETRA Tech NUS	Project Manager: Bob Davis	Date: 9-12-06	Chain of Custody Number: 308783
Address: 661 Andersen Drive	Telephone Number (Area Code)/Fax Number: 412 921 7251	Lab Number	Page 1 of 1
City: Pittsburgh State: PA Zip Code: 15220	Site Contact: MARK MENGEL	Lab Contact	
Project Name and Location (State): NS GREAT LAKES NTC 22	Carrier/Waybill Number: FED EX 8545 6732 5578		
Contract/Purchase Order/Quote No.			

Analysis (Attach list if more space is needed): ENCORE (VOCS); MOISTURE (2oz)

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Air	Aqueous	Sed.	Soil	Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	ENCORE (VOCS)	MOISTURE (2oz)	Special Instructions/ Conditions of Receipt
NTC22SB200203 R2	9/12/06	0745				X							3	X	
NTC22 SB200607 R2	9/12/06	0755				X							3	X	
NTC MW05$0001 R2	9/12/06	0815				X							3	X	
N6L95 105$0001 R2	9/12/06	0845				X							3	X	
6L95105$0203 R2	9/12/06	0850				X							3	X	72 hr TURNAROUND
NTC22SB15 0001 R2	9/12/06	0910				X							3	X	
NTC 22SB 15 1112 R2	9/12/06	0925				X							9	X	DO MS/MSD
NTC22 MW10D 0708 R2	9/12/06	1110				X							3	X	
NTC22 MW10D 1112 R2	9/12/06	1145				X							3	X	
NTC22 MW06D 0708 R2	9/12/06	1020				X							3	X	
NTC22 FD001	9/12/06	0000				X							3	X	

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required: ☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☒ Other 72-hour

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished By: Mark L. Mengel	9/12/06	1600	1. Received By: [signature]	9-13-06	9:15
2. Relinquished By			2. Received By		
3. Relinquished By			3. Received By		

Comments

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

STL North Canton

Tetra Tech NUS

INTERNAL CORRESPONDENCE

TO:	**MR. B. DAVIS**	**DATE:**	**JANUARY 23, 2007**
FROM:	**EDWARD SEDLMYER**	**COPIES:**	**DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION- VOA**
CTO 009, NTC GREAT LAKES
SDG 6I29215

SAMPLES: 3/Solid

NTL22MW10D1012R3 NTL22SB151112R3 NTL22SB221819R3

OVERVIEW

The sample set for CTO 009 NTC Great Lakes, SDG 6I29215 consists of, three (3) soil environmental samples. All samples were analyzed for select volatile organic compounds (VOCs).

The samples were collected by TetraTech NUS on September 28, 2006 and analyzed by Severn Trent Laboratories, Inc., North Canton, OH. All analyses were conducted in accordance with USEPA SW 846 Method 8260B analytical and reporting protocol. The data contained in this SDG were validated with regard to the following parameters:

- * Data Completeness
- * Holding Times
- * Initial and Continuing Calibration
- * Laboratory Blank Analyses
- * Detection Limits

In addition, sample NTL22MW10D1012R3 was also validated with regard to the following parameters:

- * Surrogate Recoveries
- * Blank Spike/Blank Spike Duplicate Results
- * Matrix Spike/Matrix Spike Duplicate Results
- * Internal Standard Recoveries
- * Compound Quantitation
- * Compound Identification

The symbol (*) indicates that quality control criteria were met for this parameter. Problems affecting data quality are discussed below; documentation supporting these findings is presented in Appendix C. Qualified Analytical results are presented in Appendix A. Results as reported by the laboratory are presented in Appendix B.

Volatile

Samples NTL22MW10D1012R3 and NTL22SB221819R3 required dilutions for tetrachloroethene and/or trichloroethene. No qualification of the data was necessary.

Additional Comments:

Positive results less than the reporting limit (RL) were qualified as estimated, J, due to uncertainty near the detection limit.

Detection limits for all samples are elevated due to the medium level preparation procedure. Detection limits for all compounds exceed those listed in the laboratory specification.

EXECUTIVE SUMMARY

Laboratory Performance Issues: None.

Other factors affecting data quality: None.

The data for these analyses were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation (October 1999) and the Department of Defense (DoD) document entitled "Quality Systems Manual (QSM) for Environmental Laboratories" (January 2006). The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the DoD QSM."

Edward Sedlmyer

Tetra Tech NUS

Edward Sedlmyer
Chemist/Data Validator

TetraTech NUS

Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:

Appendix A – Qualified Analytical Results
Appendix B – Results as Reported by the Laboratory
Appendix C – Support Documentation

Data Validation Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration Noncompliance (e.g. % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01 = GC/MS Tuning Noncompliance
D = MS/MSD Recovery Noncompliance
E = LCS/LCSD Recovery Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS - GFAA MSA's $r < 0.995$ / ICP PDS Recovery Noncompliance
K = ICP Interference - includes ICS % R Noncompliance
L = Instrument Calibration Range Exceedance
M = Sample Preservation Noncompliance
N = Internal Standard Noncompliance
N01 = Internal Standard Recovery Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (e.g. base-line drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues; e.g. chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = % Difference between columns/detectors >25% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient $r < 0.995$
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 sigma deviation is greater than sample activity

APPENDIX A

QUALIFIED ANALYTICAL RESULTS

PROJ_NO: 00202

SDG: 6I29215 MEDIA: SOIL DATA FRACTION: OV

nsample	NTL22MW10D1012R3DL
samp_date	9/28/2006
lab_id	A6I290215002
qc_type	NM
units	UG/KG
Pct_Solids	86.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	470	U	
1,1,1-TRICHLOROETHANE	470	U	
1,1,2,2-TETRACHLOROETHANE	470	U	
1,1,2-TRICHLOROETHANE	470	U	
1,1-DICHLOROETHANE	470	U	
1,1-DICHLOROETHENE	470	U	
1,2-DICHLOROETHANE	470	U	
CARBON TETRACHLORIDE	470	U	
CHLOROETHANE	470	U	
CHLOROMETHANE	470	U	
CIS-1,2-DICHLOROETHENE	470	U	
TETRACHLOROETHENE	15000		
TRANS-1,2-DICHLOROETHENE	470	U	
TRICHLOROETHENE	380	J	P
VINYL CHLORIDE	470	U	

nsample	NTL22SB151112R3DL
samp_date	9/28/2006
lab_id	A6I290215001
qc_type	NM
units	UG/KG
Pct_Solids	87.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	240	U	
1,1,1-TRICHLOROETHANE	240	U	
1,1,2,2-TETRACHLOROETHANE	240	U	
1,1,2-TRICHLOROETHANE	240	U	
1,1-DICHLOROETHANE	240	U	
1,1-DICHLOROETHENE	240	U	
1,2-DICHLOROETHANE	240	U	
CARBON TETRACHLORIDE	240	U	
CHLOROETHANE	240	U	
CHLOROMETHANE	240	U	
CIS-1,2-DICHLOROETHENE	240	U	
TETRACHLOROETHENE	960		
TRANS-1,2-DICHLOROETHENE	240	U	
TRICHLOROETHENE	56	J	P
VINYL CHLORIDE	240	U	

nsample	NTL22SB221819R3DL
samp_date	9/28/2006
lab_id	A6I290215003
qc_type	NM
units	UG/KG
Pct_Solids	86.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	380	U	
1,1,1-TRICHLOROETHANE	380	U	
1,1,2,2-TETRACHLOROETHANE	380	U	
1,1,2-TRICHLOROETHANE	380	U	
1,1-DICHLOROETHANE	380	U	
1,1-DICHLOROETHENE	380	U	
1,2-DICHLOROETHANE	380	U	
CARBON TETRACHLORIDE	380	U	
CHLOROETHANE	380	U	
CHLOROMETHANE	380	U	
CIS-1,2-DICHLOROETHENE	74	J	P
TETRACHLOROETHENE	11000		
TRANS-1,2-DICHLOROETHENE	380	U	
TRICHLOROETHENE	4000		
VINYL CHLORIDE	380	U	

14

Chain of Custody Record

STL-4124 (0901)

SEVERN TRENT **STL**

Severn Trent Laboratories, Inc.

Client: TETRA TECH NUS INC.	Project Manager: Bob DAVIS	Date: 9-28-06	Chain of Custody Number: 306977
Address: 661 ANDERSEN DRIVE STE 5	Telephone Number (Area Code)/Fax Number: 412-921-7251	Lab Number:	Page 1 of 1
City: PITTSBURGH · State: PA · Zip Code: 15220	Site Contact: HOWARD HICKEY · Lab Contact: LOIS EZZO		
Project Name and Location (State): NAVAL STATION GREAT LAKES	Carrier/Waybill Number: 8545 6732 5589		
Contract/Purchase Order/Quote No.: 112G00202			

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil		Containers & Preservatives: Unpres.	H_2SO_4	HNO_3	HCl	NaOH	ZnAc/NaOH	Analysis (Attach list if more space is needed): ENCORE (VOCs)	MOISTURE	Special Instructions/ Conditions of Receipt
NTC22SB151112R3	9/28	1325				X								3	1	72 hr. TURNAROUND
NTC22MW10D1012R3	9/28	1410				X								3	1	
NTC22SB221819R3	9/28	1445				X								3	1	

Possible Hazard Identification

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal

☐ Return To Client ☐ Disposal By Lab ☐ Archive For ______ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required

☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☒ Other 72 HOUR

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished By: Mark L. Mengel	9/28/06	1600	1. Received By: [illegible]	9-29-06	9:20
2. Relinquished By			2. Received By		
3. Relinquished By			3. Received By		

Comments

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

STL North Canton

MARCH 2007

Tetra Tech NUS

INTERNAL CORRESPONDENCE

TO:	**B. DAVIS**	**DATE:**	**APRIL 17, 2007**
FROM:	**TERRI L. SOLOMON**	**COPIES:**	**DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION –VOCs**
CTO – 009 NTC GREAT LAKES
SAMPLE DELIVERY GROUP (SDG) – 7C13195

SAMPLES: 4/Aqueous/

NTC22MW06SR	NTC22MW10DR
NTC22MW10SR	TRIP BLANK

Overview

The sample set for CTO 009, NTC Great Lakes, SDG 7C13195, consists of three (3) environmental samples and one (1) trip blank. No field duplicate pairs were included within this SDG.

All samples were analyzed for select volatile organic compounds (VOCs). The samples were collected by Tetra Tech NUS on March 10 and 11, 2007 and analyzed by Severn Trent Laboratories – North canton under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. VOC analyses were conducted using SW-846 method 8260B.

These data were evaluated based on the following parameters:

* • Data Completeness
* • Holding Times
  • Initial / Continuing Calibration Results
* • Laboratory / Field Blank Analyses
* • Detection Limits

In addition, sample NTC22MW06SR was also validated with regard to the following parameters:

* • Surrogate Recoveries
* • Blank Spike / Blank Spike Duplicate Results
* • Matrix Spike / Matrix Spike Duplicate Results
* • Internal Standard Recoveries
* • Compound Quantitation
* • Compound Identification

* - All quality control criteria were met for this parameter.

Initial / Continuing Calibration Results

Continuing calibration percent difference (3/15/07 8:17) for chloroethane was > 25% quality control limit. The nondetected result reported for chloroethane affecting sample NTC22MW06SR was qualified as estimated, "UJ".

Notes

Positive results reported below the reporting limit (RL) but above the method detection limit (MDL) for the organic analyses were qualified as estimated, "J".

Executive Summary

Laboratory Performance: A continuing calibration noncompliance was noted for chloroethane.

Other Factors Affecting Data Quality: None.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Organic Review", October 1999 and the DOD document entitled "Quality System Manual (QSM) for Environmental Laboratories" (Jan 2006).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the DOD QSM and the Quality Assurance Project Plan (QAPP)."

Terri L. Solomon

Tetra Tech NUS
Terri L. Solomon
Environmental Scientist

Tetra Tech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

APPENDIX A
QUALIFIED ANALYTICAL RESULTS

Data Validation Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration Noncompliance (e.g. % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01 = GC/MS Tuning Noncompliance
D = MS/MSD Recovery Noncompliance
E = LCS/LCSD Recovery Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS-GFAA MSA's r < 0.995 / ICP PDS Recovery Noncompliance
K = ICP Interference - includes ICS % R Noncompliance
L = Instrument Calibration Range Exceedance
M = Sample Preservation Noncompliance
N = Internal Standard Noncompliance
N01 = Internal Standard Recovery Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O - Poor Instrument Performance (e.g. base-line drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues; e.g. chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DOT and Endrin
U = % Difference between columns/detectors >25% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient r < 0.995
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 sigma deviation is greater than sample activity

PROJ_NO: 00202

SDG: 7C13195 MEDIA: WATER DATA FRACTION: OV

nsample	NTC22MW06SR
samp_date	3/11/2007
lab_id	A7C130195003
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	1	U	
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2-DICHLOROETHANE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROETHANE	1	UJ	C
CHLOROMETHANE	0.38	J	P
CIS-1,2-DICHLOROETHENE	2.3		
TETRACHLOROETHENE	9.2		
TRANS-1,2-DICHLOROETHENE	1	U	
TRICHLOROETHENE	5.2		
VINYL CHLORIDE	1	U	

nsample	NTC22MW10DR
samp_date	3/10/2007
lab_id	A7C130195002
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	1	U	
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2-DICHLOROETHANE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROETHANE	1	U	
CHLOROMETHANE	1	U	
CIS-1,2-DICHLOROETHENE	0.21	J	P
TETRACHLOROETHENE	16		
TRANS-1,2-DICHLOROETHENE	1	U	
TRICHLOROETHENE	1.2		
VINYL CHLORIDE	1	U	

nsample	NTC22MW10SR
samp_date	3/10/2007
lab_id	A7C130195001
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	1	U	
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2-DICHLOROETHANE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROETHANE	1	U	
CHLOROMETHANE	1	U	
CIS-1,2-DICHLOROETHENE	1.3		
TETRACHLOROETHENE	1.2		
TRANS-1,2-DICHLOROETHENE	1	U	
TRICHLOROETHENE	1	U	
VINYL CHLORIDE	1	U	

PROJ_NO: 00202

SDG: 7C13195 MEDIA: WATER DATA FRACTION: OV

nsample	TRIP BLANK
samp_date	3/11/2007
lab_id	A7C130195004
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,1,2-TETRACHLOROETHANE	1	U	
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	1	U	
1,1,2-TRICHLOROETHANE	1	U	
1,1-DICHLOROETHANE	1	U	
1,1-DICHLOROETHENE	1	U	
1,2-DICHLOROETHANE	1	U	
CARBON TETRACHLORIDE	1	U	
CHLOROETHANE	1	U	
CHLOROMETHANE	1	U	
CIS-1,2-DICHLOROETHENE	1	U	
TETRACHLOROETHENE	1	U	
TRANS-1,2-DICHLOROETHENE	1	U	
TRICHLOROETHENE	1	U	
VINYL CHLORIDE	1	U	

TETRA TECH NUS, INC. — **CHAIN OF CUSTODY** — NUMBER 4609 — PAGE ___ OF ___

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
112600202	NTC GREAT LAKES	Bob Davis	412-921-7251	SEVERN TRENT / LOIS EZZO

SAMPLERS (SIGNATURE)	FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
Mark L. Mengel	MARK MENGEL	412 921-8723	4101 SHUFFEL DRIVE

CARRIER/WAYBILL NUMBER	CITY, STATE
FEDEx 8545 6732 8224	North Canton, Oh. 44720

STANDARD TAT ☐
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☒ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): G
PRESERVATIVE USED: HCL
TYPE OF ANALYSIS: 40 ml VOA

DATE YEAR 2007	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	40 ml VOA								COMMENTS
3/10	1000	NTC22MW10Ø R	–	–	–	GW	G	3	3								
3/10	1245	NTC22MW100R	–	–	–	GW	G	3	3								
3/11	1315	NTC22MW06Ø R	–	–	–	GW	G	3	3								
		TRIP BLANK															

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY			1. RECEIVED BY		
2. RELINQUISHED BY Mark L. Mengel	3-12-07	1500	2. RECEIVED BY [signature]	3/13/07	0930
3. RELINQUISHED BY			3. RECEIVED BY		

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

STL North Canton

APPENDIX G

NAVAL STATION GREAT LAKES GROUNDWATER USE RESTRICTIONS MEMORANDUM

DEPARTMENT OF THE NAVY
NAVAL STATION
2601 E PAUL JONES ST
GREAT LAKES, ILLINOIS 60088-2845

NAVSTAGLAKESINST 11130.1
ENV
29 Sep 03

NAVAL STATION GREAT LAKES INSTRUCTION 11130.1

From: Commanding Officer, Naval Station Great Lakes

Subj: Ground Water Use Restrictions

1. Purpose. To ensure compliance with environmental regulations for activities and personnel located on Naval Station Great Lakes.

2. Scope. This instruction applies to all geographic areas of the Naval Station.

3. Discussion.

a. The use of ground water and surface water runoff for any purpose is strictly prohibited unless prior, written approval is obtained from the Commanding Officer, Naval Station Great Lakes. This includes, but is not limited to the installation of wells for any purpose, use of storm water run off from streams or retention ponds, etc.

b. The only exception to this prohibition is the installation of ground water monitoring wells for the exclusive purpose of sampling ground water and monitoring of ground water/surface water. Approval for this activity must be secured in writing in advance from the Naval Station Great Lakes Environmental Department in coordination with the appropriate regulatory agencies.

4. Action. To initiate the process for installing a ground water well aboard the Naval Station, contact Naval Station Great Lakes Environmental Department, at (847) 688-5999 Or DSN 792-5999.

H P Rouf
K. M. Hobbs

Distribution:
NAVASTAGLAKES 5216.5
LISTS I AND II

APPENDIX H

GROUNDWATER MODELING CALCULATIONS

Calculation of PCE Migration at Site 22 Using Tier 2 Lateral Groundwater Transport Equation R26:

Steady State:
Cx = Cs*exp((X/2*ax)*(1-sqrt(1+(4*λ*ax)/U)))*erf(Sw/(4*sqrt(ay*X)))*erf(Sd/(2*sqrt(az*X)))

Parameter	Value	Units	Description
Cx		ug/L	Concentration of constituent in groundwater at distance X downgradient of source
Cs	16.0	ug/L	Concentration of constituent in source zone
K	0.796	ft/day	Hydraulic conductivity
I	0.264	ft/ft	Hydraulic gradient
θ_T	0.35	unitless	Total soil porosity for silt
U	0.600	ft/day	Specific discharge, or groundwater seepage velocity (eq. R19)
X	75	feet	Distance between source and point of exposure
ax	7.5	feet	=X*0.1, see eq. R16
ay	2.50	feet	=ax/3, see eq. R17
az	0.38	feet	=ax/20, see eq. R18
Sw	20	feet	Source width perpendicular to groundwater flow
Sd	15	feet	Source depth or thickness of groundwater stratum
λ	9.60E-04	$days^{-1}$	First order degradation rate
exp			Exponential
erf			Error function

Cx	5.35	ug/L	Calculated concentration of constituent in groundwater arriving at the unnamed tributary stream

Calculation of PCE Migration at Site 22 Using Tier 2 Lateral Groundwater Transport Equation R26:

Steady State:
Cx = Cs*exp((X/2*ax)*(1-sqrt(1+(4*λ*ax)/U)))*erf(Sw/(4*sqrt(ay*X)))*erf(Sd/(2*sqrt(az*X)))

Parameter	Value	Units	Description
Cx		ug/L	Concentration of constituent in groundwater at distance X downgradient of source
Cs	16.0	ug/L	Concentration of constituent in source zone
K	0.796	ft/day	Hydraulic conductivity
I	0.168	ft/ft	Hydraulic gradient
θ_T	0.35	unitless	Total soil porosity for silt
U	0.382	ft/day	Specific discharge, or groundwater seepage velocity (eq. R19)
X	75	feet	Distance between source and point of exposure
ax	7.5	feet	=X*0.1, see eq. R16
ay	2.50	feet	=ax/3, see eq. R17
az	0.38	feet	=ax/20, see eq. R18
Sw	20	feet	Source width perpendicular to groundwater flow
Sd	15	feet	Source depth or thickness of groundwater stratum
λ	9.60E-04	$days^{-1}$	First order degradation rate
exp			Exponential
erf			Error function
Cx	5.01	ug/L	Calculated concentration of constituent in groundwater arriving at the unnamed tributary stream

Calculation of PCE Migration at Site 22 Using Tier 2 Lateral Groundwater Transport Equation R26:

Steady State:
Cx = Cs*exp((X/2*ax)*(1-sqrt(1+(4*λ*ax)/U)))*erf(Sw/(4*sqrt(ay*X)))*erf(Sd/(2*sqrt(az*X)))

Parameter	Value	Units	Description
Cx		ug/L	Concentration of constituent in groundwater at distance X downgradient of source
Cs	16.0	ug/L	Concentration of constituent in source zone
K	0.796	ft/day	Hydraulic conductivity
I	0.119	ft/ft	Hydraulic gradient
θ_T	0.35	unitless	Total soil porosity for silt
U	0.271	ft/day	Specific discharge, or groundwater seepage velocity (eq. R19)
X	75	feet	Distance between source and point of exposure
ax	7.5	feet	=X*0.1, see eq. R16
ay	2.50	feet	=ax/3, see eq. R17
az	0.38	feet	=ax/20, see eq. R18
Sw	20	feet	Source width perpendicular to groundwater flow
Sd	15	feet	Source depth or thickness of groundwater stratum
λ	9.60E-04	$days^{-1}$	First order degradation rate
exp			Exponential
erf			Error function

Cx	4.65	ug/L	Calculated concentration of constituent in groundwater arriving at the unnamed tributary stream

Calculation of PCE Migration at Site 22 Using Tier 2 Lateral Groundwater Transport Equation R26:

Steady State:

Cx = Cs*exp((X/2*ax)*(1-sqrt(1+(4*λ*ax)/U)))*erf(Sw/(4*sqrt(ay*X)))*erf(Sd/(2*sqrt(az*X)))

Parameter	Value	Units	Description
Cx		ug/L	Concentration of constituent in groundwater at distance X downgradient of source
Cs	16.0	ug/L	Concentration of constituent in source zone
K	0.796	ft/day	Hydraulic conductivity
I	0.264	ft/ft	Hydraulic gradient
θ_T	0.35	unitless	Total soil porosity for silt
U	0.600	ft/day	Specific discharge, or groundwater seepage velocity (eq. R19)
X	1300	feet	Distance between source and point of exposure
ax	130	feet	=X*0.1, see eq. R16
ay	43.33	feet	=ax/3, see eq. R17
az	6.50	feet	=ax/20, see eq. R18
Sw	20	feet	Source width perpendicular to groundwater flow
Sd	15	feet	Source depth or thickness of groundwater stratum
λ	9.60E-04	$days^{-1}$	First order degradation rate
exp			Exponential
erf			Error function
Cx	0.006	ug/L	Calculated concentration of constituent in groundwater arriving at the unnamed tributary stream

Calculation of PCE Migration at Site 22 Using Tier 2 Lateral Groundwater Transport Equation R26:

Steady State:
Cx = Cs*exp((X/2*ax)*(1-sqrt(1+(4*λ*ax)/U)))*erf(Sw/(4*sqrt(ay*X)))*erf(Sd/(2*sqrt(az*X)))

Parameter	Value	Units	Description
Cx		ug/L	Concentration of constituent in groundwater at distance X downgradient of source
Cs	16.0	ug/L	Concentration of constituent in source zone
K	0.796	ft/day	Hydraulic conductivity
I	0.168	ft/ft	Hydraulic gradient
θ_T	0.35	unitless	Total soil porosity for silt
U	0.382	ft/day	Specific discharge, or groundwater seepage velocity (eq. R19)
X	1300	feet	Distance between source and point of exposure
ax	130	feet	=X*0.1, see eq. R16
ay	43.33	feet	=ax/3, see eq. R17
az	6.50	feet	=ax/20, see eq. R18
Sw	20	feet	Source width perpendicular to groundwater flow
Sd	15	feet	Source depth or thickness of groundwater stratum
λ	9.60E-04	$days^{-1}$	First order degradation rate
exp			Exponential
erf			Error function
Cx	0.0026	ug/L	Calculated concentration of constituent in groundwater arriving at the unnamed tributary stream

Calculation of PCE Migration at Site 22 Using Tier 2 Lateral Groundwater Transport Equation R26:

Steady State:
Cx = Cs*exp((X/2*ax)*(1-sqrt(1+(4*λ*ax)/U)))*erf(Sw/(4*sqrt(ay*X)))*erf(Sd/(2*sqrt(az*X)))

Parameter	Value	Units	Description
Cx		ug/L	Concentration of constituent in groundwater at distance X downgradient of source
Cs	16.0	ug/L	Concentration of constituent in source zone
K	0.796	ft/day	Hydraulic conductivity
I	0.119	ft/ft	Hydraulic gradient
θ_T	0.35	unitless	Total soil porosity for silt
U	0.271	ft/day	Specific discharge, or groundwater seepage velocity (eq. R19)
X	1300	feet	Distance between source and point of exposure
ax	130	feet	=X*0.1, see eq. R16
ay	43.33	feet	=ax/3, see eq. R17
az	6.50	feet	=ax/20, see eq. R18
Sw	20	feet	Source width perpendicular to groundwater flow
Sd	15	feet	Source depth or thickness of groundwater stratum
λ	9.60E-04	$days^{-1}$	First order degradation rate
exp			Exponential
erf			Error function
Cx	0.0011	ug/L	Calculated concentration of constituent in groundwater arriving at the unnamed tributary stream

APPENDIX I

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA) CLOSURE FORMS

ILLINOIS EPA RCRA CORRECTIVE ACTION CERTIFICATION

This certification must accompany any document submitted to Illinois EPA in accordance with the corrective action requirements set forth in a facility's RCRA permit. The original and two copies of all documents submitted must be provided.

1.0 FACILITY IDENTIFICATION

Name: Naval Station Great Lakes

County: Lake

Street Address: Former Bldg 105, Sampson Street and Porter Ave

Site No. (IEPA): 0971255004

City: Great Lakes

Site No. (USEPA): IL7170024577

2.0 OWNER INFORMATION

Name: US Department of the Navy

Mailing Address: Code N45 @ 201 Decatur Avenue, Building 1A
Naval Station Great Lakes
Great Lakes, IL 60088-5600

Contact Name: Mark Schultz

Contact Title: Environmental Director

Phone No.: 847-688-5999 Ext 40

3.0 OPERATOR INFORMATION

Same as Owner

4.0 TYPE OF SUBMISSION (check applicable item and provide requested information, as applicable)

- ☐ RFI Phase I Workplan/Report
- ☐ RFI Phase II Workplan/Report
- ☐ CMP Report; Phase ________
- ☒ Other (describe):

ERH Treatability Study Report

Date of Submittal June 2007

IEPA Permit Log No. C-689

Date of Last IEPA Letter on Project Aril 9, 2003

Log No. of Last IEPA Letter on Project C-689-M-8

Does this submittal include groundwater information: ☒ Yes ☐ No

5.0 DESCRIPTION OF SUBMITTAL: (briefly describe what is being submitted and its purpose)

The results of the ERH treatability study are being submitted. With the remediation accomplished during the study, the document states that the hazardous waste unit has been closed in accordance with a plan approved by the Illinois EPA.

6.0 DOCUMENTS SUBMITTED (identify all documents in submittal, including cover letter; give dates of all documents)

This submittal includes the cover letter and Electric Resistance Heating (ERH) Treatability Study Report for Site 22 Former Building 105 Old Dry Cleaning Facility (June 2007)

7.0 CERTIFICATION STATEMENT - ***(This statement is part of the overall certification being provided by the owner/operator, professional and laboratory in Items 7.1, 7.2 and 7.3 below).*** The activities described in the subject submittals have been carried out in accordance with procedures approved by Illinois EPA. I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

7.1 OWNER/OPERATOR CERTIFICATION (Must be completed for all submittals. Certification and signature requirements are set forth in 35 IAC 702.126.) All submittals pertaining to the corrective action requirements set forth in a RCRA Permit must be signed by the person designated below (or by a duly authorized representative of that person):

1. For a Corporation, by a principal executive officer of at least the level of vice-president.
2. For a Partnership or Sole Proprietorship, by a general partner or the proprietor, respectively.
3. For a Governmental Entity, by either a principal executive officer or a ranking elected official.

A person is a duly authorized representative only if:

1. the authorization is made in writing by a person described above; and
2. the written authorization is provided with this submittal (a copy of a previously submitted authorization can be used).

Owner Signature: ______________________________ ______________ (Date)

Title: ______________________________

Operator Signature: ______________________________ ______________ (Date)

Title: ______________________________

7.2 PROFESSIONAL CERTIFICATION ***(if necessary)*** - Work carried out in this submittal or the regulations may also be subject to other laws governing professional services, such as the Illinois Professional Land Surveyor Act of 1989, the Professional Engineering Practice Act of 1989, the Professional Geologist Licensing Act, and the Structural Engineering Licensing Act of 1989. No one is relieved from compliance with these laws and the regulations adopted pursuant to these laws. All work that falls within the scope and definitions of these laws must be performed in compliance with them. The Illinois EPA may refer any discovered violation of these laws to the appropriate regulating authority.

Professional's Signature: ______________________________ ______________ Date:

Professional's Name: Robert F. Davis, PE

Professional's Seal:

Professional's Address: Tetra Tech NUS, Inc.
661 Andersen Road
Pittsburgh, PA 15220

Professional's Phone No.: 412-921-7251

7.3 LABORATORY CERTIFICATION ***(if necessary)*** - The sample collection, handling, preservation, preparation and analysis efforts for which this laboratory was responsible were carried out in accordance with procedures approved by Illinois EPA.

Name of Laboratory ______________________________

____
Signature of Laboratory Responsible Officer — Date

Mailing Address of Laboratory

____
____
____

____
Name and Title of Laboratory Responsible Officer

RCRA Interim Status Closure Certification Statement

To meet the requirements of 35 Ill. Adm. Code 725.215, this statement is to be completed by a responsible officer of the owner/operator (as defined in 35 Ill. Adm. Code 702.126) and an independent licensed professional engineer upon completion of interim status closure of a hazardous waste management unit.

Facility Name: Naval Station Great Lakes

Illinois EPA Identification Number: 0971255004

USEPA Identification Number: IL7170024577

Illinois EPA Closure Log No.: C-689

Name of Unit(s) Being Closed: Site 22, Former Building 105 Old Dry Cleaning Facility

The hazardous waste management unit(s) identified above has/have been closed in accordance with the specifications in a plan approved with conditions and modifications by Illinois EPA. A report demonstrating closure was carried out in accordance with the approved plan is attached.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature of Owner/Operator Responsible Officer　　Date

Name and Title of Owner/Operator

Signature of Licensed P.E.　　Date

Name of Licensed P.E. and Ill. License No.

Mailing Address of P.E.:

Robert F. Davis, PE

Tetra Tech NUS, Inc., 661 Andersen Drive

Pittsburgh, PA 15220

Licensed P.E.'s Seal:

JKM:bjh\rcra-interim-status-closure-certification.doc